

AUGUST, 1961

Delta Pioneers with Punch Cards

Progress in automation of purchasing
and stores is paving the way for industry
adoption of a new standard . . . page 23



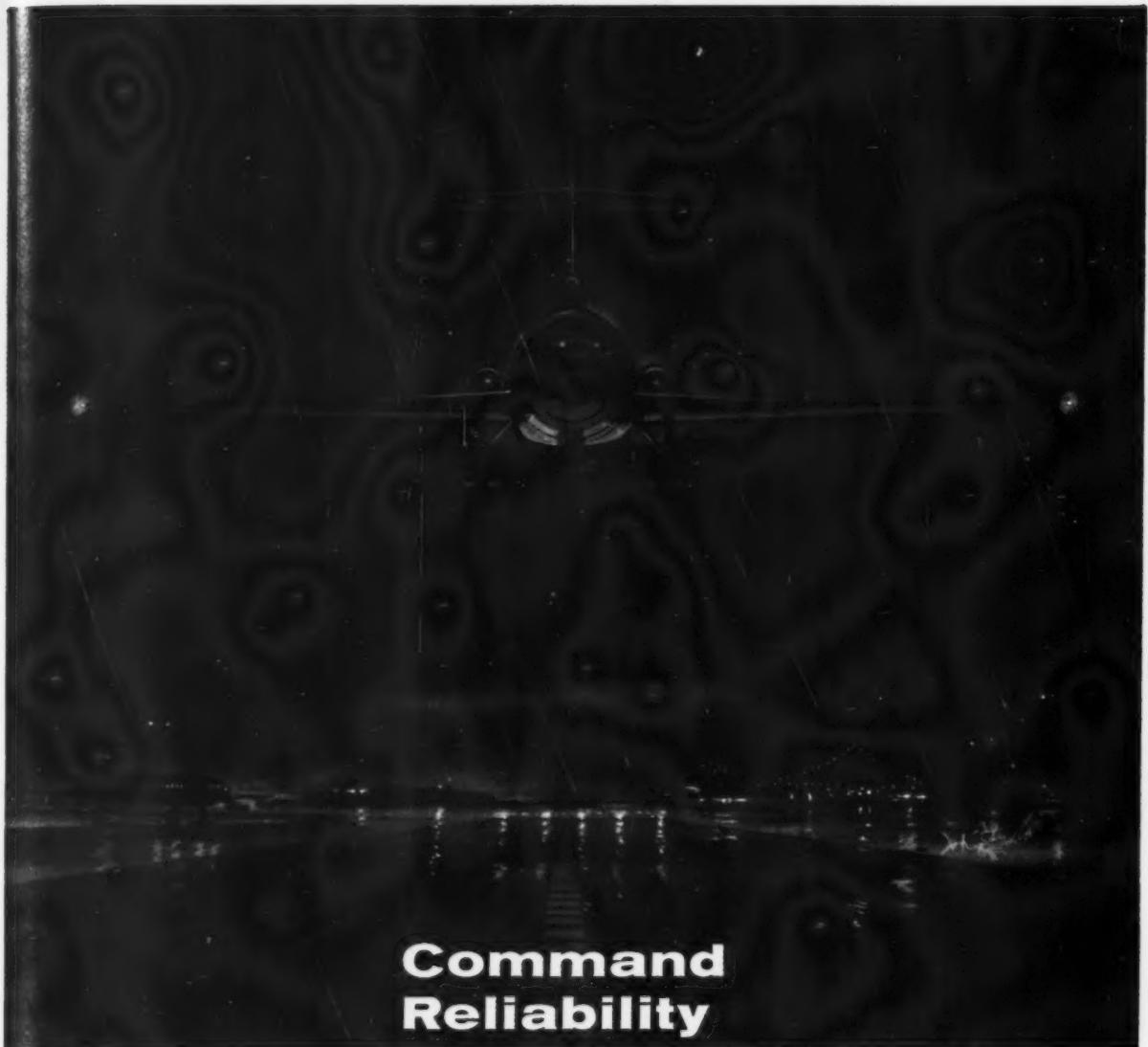
Dear American Airlines:

Recently your reservations people helped me complete a lengthy trip with an involved itinerary. Their graciousness and knowledge were exceptional. It was a pleasure to have their help.

Chris D. McKeon

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Selection of the SP-50 for the short-to-medium range 727—a jet transport which demands the ultimate in reliability for everyday operations in and out of small airports—emphasizes the fact that the SP-50 solves the most pressing problems of second-generation jetliners: it is compatible with the fully automatic landing systems of the future; it is designed for routine ILS operations with automatic letdowns for landings under very low ceiling-visibility conditions; it features *channelized* design, separating automatic control equipment for all axes of flight to facilitate maintenance; and it provides dual yaw dampers, with provisions for "dualizing" all functions if desired.

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SPERRY



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AUGUST, 1961

airlift

WORLD AIR TRANSPORTATION

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THIS MONTH'S COVER—Automation invades the airlines as Marshall Pape, machine operator at Delta Air Lines, puts the company's IBM 650 to work on its IDP materials control system. Read how pioneering at Delta in punch-card purchasing and inventory control pays dividends to management in improved efficiency at lower cost, page 23. Photo by David Vaughan, Delta.

20,450 copies this issue



WESTERN'S MIGHTY JET-AGE FLEET

BRINGS YOU THE ULTIMATE IN MODERN AIR SERVICE!

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- New 720B Fan/Jets—fastest nonstops ever from Los Angeles to Mexico City
- 707 Jets—between Los Angeles, Salt Lake City, and Minneapolis/St. Paul
- 707 Jets—fastest between San Francisco, Denver, and Minneapolis/St. Paul
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White House to Search for U.S. Air Policy

WHENEVER the federal government gets itself in a box, it launches another study.

We're about to have another year-long aviation study, No. 11,348. Or did we miss a hundred?

This time it will be a review of America's foreign air policy.

It would be much more appropriate to say that the study is to find out whatever happened to U.S. foreign air policy, since we've seen no evidence of one for some years. And if this study can't find one, it is supposed to shape up one.

We have no quarrel with this forthcoming review. A lot of so-called studies could have been dispensed with quite easily before they got started, but not this one. It's long overdue. Let's hope the result is one the U.S. can be proud of.

One thing will be achieved at the outset: a lot of propaganda statements and political speeches will be hushed up. Of late there has been a rash of statements made about the U.S. losing its strong position in the air. Some of this has been true, but a lot of mis-statements have been made, a lot of facts have been distorted, and a lot of nasty attacks made. Unfortunately, some of these attacks have been made on countries that must rely, as does the U.S., on the widest scope of freedoms of the air, for only the British (through the Commonwealth and remaining colonial outposts) and the French have ready-made stepping stones around the world.

As it should be, the review will be made under the supervision of the White House and the Bureau of the Budget, and will be performed largely by a major research institution. Our one hope is that the Civil Aeronautics Board will not be shoved into the background, for CAB Chairman Alan S. Boyd is learning fast and has acquired a fair and progressive outlook.

It is high time the U.S. found out where it is going and where it wants to go in international air transportation. Air rights have been bartered away piece-meal. There has been no consistency whatever. Fresh and untrained negotiating teams have been used for each bilateral. Meantime, the British, long-skilled and far-seeing on international matters, have out-maneuvered the U.S. time after time.

In 1944 the U.S. started out to be the champion of freedom of the air. In 1961 the cry is for restrictions. The British, who have long been the true sponsors of restrictions, even though those restrictions were called "freedoms," are now regarded as the "protectors" of other airlines against the U.S., an ironical situation if one ever existed.

All of this is presumably outlined and recommended in the soon forthcoming *Project Horizon*

report on aviation goals. But the groundwork is already laid and funds allocated for the foreign air policy review and the sooner it gets under way with top-notch talent, the better for everyone.

Sweet Mystery of Life

AH, THESE CITIZENS' groups that protest about airplane noise! Less than a year ago Herbert Nelson, chairman of a civic group in the Chicago Midway Airport area, was leading one devil of a drive to keep jets out of Midway. He and his fellow citizens thought United was planning to operate Caravelles from this field and they wanted no part of it. No siree.

Today this civic group, and all the merchants around Midway, are bitterly protesting the economic slump overtaking the area since the removal of a lot of service to O'Hare. Jet services have taken over the bulk of the traffic to and from Chicago and jets operate only from the larger field northwest of the city. So Midway traffic is way off. Business in the area is hurting. Now Mr. Nelson says his group must fight for jet service at Midway and try to retain air service there instead of fighting it.

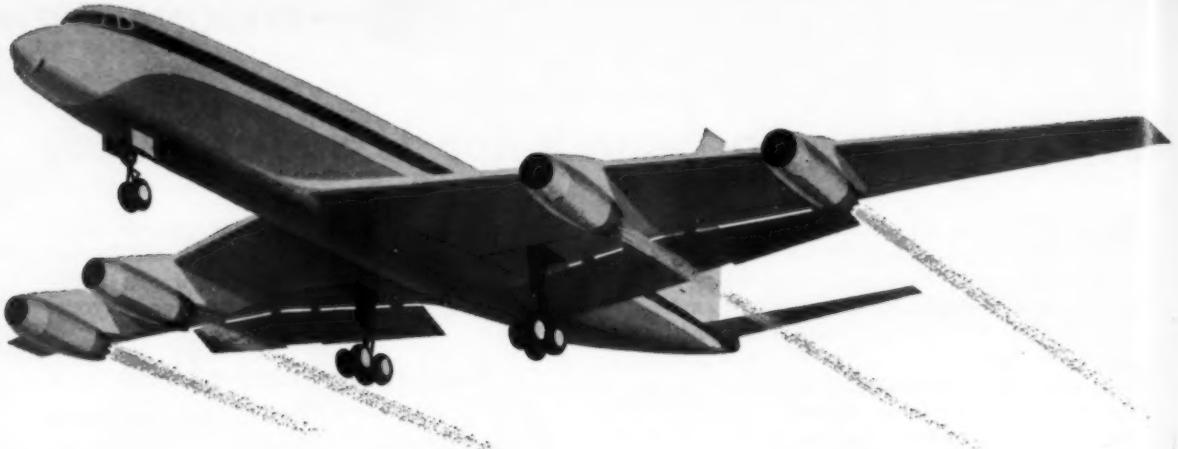
So an airport does seem to have some value, after all! Only trouble is, it takes some folks so danged long to recognize it. And it would seem that there is an economic price tag on at least some of the noise complainants.

Unlimited Bonanza

NEW IDEAS keep pouring out of Bonanza Air Lines, the all jet-prop local carrier operating in California, Arizona, Nevada and Utah. On top of various types of excursion fares, now comes a proposal filed with the CAB for an "air-tour" tariff by which purchasers would be entitled to unlimited travel over the system for 15 days for \$90, or 30 days at \$160. Only those living outside the Bonanza area could buy the tickets and original transportation would have to originate at points in the U.S. east of the Mississippi or in Alaska, Hawaii or below the 25th parallel in Mexico, or other non-U.S. points.

The plan is similar to the successful "Eurail Pass" for unlimited rail travel in Europe for set periods of time and available at low cost only to those residing outside Europe. Cooperating with Bonanza is the American Society of Travel Agents. It's an interesting concept.

Wayne W. Parish



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operating procedures
or conditions—

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Two of Champion's jet igniters—the AA37S and AA42S—are particularly outstanding examples of how Champion specifically designs igniters to meet the needs of our jet age.

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Model of Aircraft	Type of Engine	Champion Igniter
Boeing 707.....	P&W JT3C.....	AA15S AA37S
P&W JT3D.....		AA37S
P&W JT4A.....		AA16S AA42S
Convair 880.....	GE CJ805-3.....	FHE-100-6
990.....	GE CJ805-23.....	AA30S-1
Douglas DC-8.....	P&W JT3C.....	AA15S AA37S
	P&W JT3D.....	AA37S
	P&W JT4A.....	AA16S AA42S
Lockheed Electra.....	Allison 501-D13.....	FS-89-1

IGNITERS FOR AUXILIARY FLIGHT POWER EQUIPMENT

Make of Engine	Model of Engine	Champion Igniter
Airesearch.....	FAC250-29.....	AA34S-1
	ATSF100-21, 32	FHE-53-5
Airesearch.....	FAC250-14.....	AA34S-1



EDITOR'S NOTE BOOK

AT VARIOUS TIMES in the past we have complained about passenger handling at both London Central and New York Idlewild airports, two of the key gateways of the world. Especially have we complained about the inability to get on an airplane at London for the Continent within a half hour of departure time.

It was with considerable glee, therefore, that we read in our esteemed British contemporary, *Flight* (June 8) that even a British aviation writer has come up against the same experience. In the "Straight and Level" page edited by Roger Bacon, pseudonym for Hugh Ramsden, appears the following:

"On May 25 a *Flight* colleague was driven to London Central by his wife, who parked the car in the 30-minute car park. The ticket was stamped 09.28 hr. He arrived at a BEA desk to check in for the ten o'clock BEA 340 flight to Paris, presenting his ticket at 09.35 hr. (Those London car parks must be mighty close to the terminal—Ed.) He was told that the flight was closed—regulations required that passengers had to check in no later than 30 minutes before departure.

"He finally got to Le Bourget, Paris, three hours late, to discover from colleagues that he had been turned away ten minutes before the arrival of the main body of passengers on a coach from London.

"Rules that lead to this sort of nonsense on a short high-frequency bus route like London-Paris really ought to be changed. When are we going to have walk-on, trickle-loaded air services?

"BEA may retort that passengers should use the coach, but this may be inconvenient for many people as it was in this case."

BRAVO! Maybe this item in *Flight* will get some action. We recall our own experience in arriving at the counter in time but not having a ticket, and telling the girl we were getting our ticket at a desk about 20 feet away, and by the time we returned the girl said we were too late for the flight—a half hour in advance of departure. Quite ridiculous for short-haul services.

It would do a lot of good if the British Ministry of Civil Aviation, which really has charge of things at London Central, would send a delegation to New York and Washington to see how short-haul services operate, the distance between New York and Washington being almost identical with the London-Paris distance. Eastern's air shuttle would be an eye-opener.

But more than that, why in the world doesn't London Central reserve two gate positions directly in front of the terminal for BEA and Air France flights to Paris, instead of making a transatlantic journey out of them by hauling passengers in those ridiculous buses through circuitous routes to far out gate positions, all for a 230-mile hop?

And about those buses! In Amsterdam, Paris and Zurich, to name three places we know about, when buses are needed to haul passengers between airplane and terminal (the Europeans don't believe in the finger extension system on airports), the buses are one-step, low-level affairs with plenty of room for baggage and standing and lots of doors. The British cling to those ungainly duplex affairs, difficult to get in and out of with hand luggage, and usually one door only is available. There is no system more antiquated in the entire world than London Central.

LA ELY WE'VE HAD two rather extraordinary experiences with deluxe flying. Normally we fly coach on the simple thesis that you get there just as fast, but for one

reason or another we've found ourselves trying out super service on occasions.

From London to Paris in June we wanted to try out the Vickers Vanguard on BEA to see what it was like. So we picked a first class dinner flight and enjoyed it very much, as much as one can enjoy a 50-minute hop no longer than New York-Washington. We had heard that the Vanguard was too noisy and had vibration, but we disagree on both counts. And it definitely is a fast vehicle.

But in the space of 35 to 40 minutes, BEA attempts to serve a deluxe dinner to some 20 first-class passengers, and believe me, it is a miracle how it's done. The cabin crew works as efficiently as possible, but to serve a round of drinks, and then a full meal, plus coffee, and for passengers to digest same, all within 40 minutes, is pretty rough. BEA does the absolute most that is physically possible in such a short time. But it proves again—why do the airlines try to serve meals on short hauls with today's fast airplanes? It's not their fault if it doesn't come off—the speed of the airplane has made it impossible except with a terrific rush that leads to indigestion. So I'll toast BEA for effort, return to tourist and eat leisurely on the ground.

The other experience was trying out American's Captain's Deluxe Service on an Electra flight leaving Washington for New York at 4:30 p.m. What with Eastern's air shuttle and Northeast's every-hour service and plenty of other schedules on other lines, we suspected that American's \$2 extra charge for this service (for a total ticket price of \$21.34 including tax) would provide us with luxury in a half-empty airplane.

Empty? There wasn't an empty seat on board, including lounge. For a 50-minute flight—just like BEA's London-Paris—there were no more than 40 minutes available to serve hors d'oeuvres and two drinks each to an Electra load. We sat opposite the galley and watched three stewardesses set an all-time record for work. It was bedlam, but organized with enthusiasm—like a fire drill.

Each passenger got a tray with six hors d'oeuvres plus cheese and crackers and a bunch of grapes. Since we can't eat most seafood, and cringe at the sight of an anchovy or sardine, we ended up with one small piece of ham on toast, and one shrimp. We don't eat cheese, either, but that isn't American's fault, and anyway we stuck it in our pocket for our room-mate, who does like it. One stewardess on the run came around with stuffed olives (we hate those, too) and hot meatballs (delicious).

Drinks were served in miniatures, two each, and the glasses had been iced up before being put on the plane, so they were nicely cold. We asked for Scotch and Soda. But the Scotch had run out, and here we were only back as far as the galley. So we sacrificed with Martinis—great sacrifice! We heard one stewardess tell another that this was the fourth trip when the Scotch ran out. Now look here, American Airlines, us Scotch fans take a dim view of this kind of shortage. Kick that bourbon-lover out of the commissary and play fair.

We must confess we didn't realize there were so many people so willing to pay a surcharge of \$2 for a first-class short-haul flight. But the load factors have been fantastic (in the 90s), despite Eastern's heavy drawing power on its air shuttle. Just as on BEA with its small first class compartment serving full dinners, it is a real chore to serve a full load even with prepared snacks and drinks. The Electra gets up and goes. In 50 short minutes you're on the ground in New York—traffic and weather permitting, of course.

. . . WWP

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our electrical connector quality has done much to put us in a top position in an important market—and to make Bendix the brand most often selected for the most demanding jobs. We are confident our electrical connector customers will tell you that no company in the industry produces higher quality than does Scintilla. This acceptance, and our resulting volume, enables us to offer reliable product performance at prices that meet—or beat—any others. There's a lot more to be said on this subject of quality with economy. Give us a call!



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Plaudits for AIRLIFT

To the Editor:

As a former airline traffic man (NWA) I find *AIRLIFT* a very effective method of keeping abreast of developments in the industry. I particularly like your periodic review of the facts-of-life in your editorial column, *Personal View*. Keep up the good work.

M. A. HOARD
Lt. Col. TC
Trans. Off.
Mil. Dist. of Washington

To the Editor:

Allow me to say that your May issue was full of useful information which is of the greatest use to me in my work.

I have always found *AIRLIFT* to be one of the best of the aviation industry's magazines and the Air Transport Progress issue confirms my views.

ROGER DE AVALON
Portugal

Rapide at Idlewild?

To the Editor:

I just read in the June *AIRLIFT* your comments on the de Havilland Rapide. I have just come back from England where, at Biggin Hill Aerodrome, there are several Rapides based and one, at least, for sale.

I was intrigued watching these little bi-planes fly in and out and couldn't resist the amusing thought—wouldn't it be fun to turn up in one at Idlewild or La Guardia?

JOHN S. RIGGS
302 East Church Street
Elmira, New York

TELPAC 'Breakthrough'

To the Editor:

Have read your excellent report on TELPAK in the June issue. This remarkable "price breakthrough", if sustained by the courts, will return substantial savings to the airlines not only in communications but in personnel. If the carriers are looking ahead, instead of following the laggard policies of the rails, they will begin now to provide for rehabilitation and training of displaced workers.

True, there is not the stability and longevity in reservations work as there is in other branches of air carrier work, due to turnover and fairly low wages. The impact on personnel may not be as severe. But reservations has served for many years as the training area for the sales force, and if the carriers hope to fill those empty seats they had better plan now to provide a new source of sales training.

Of course, if the remaining reservationists become as specialized and proficient as you indicate the new system demands, there will be higher wages and greater job opportunity for the few that stay.

Your reference to flight operations, including dispatch, fails to reflect what has already occurred, irrespective of TELPAK. Many carriers have long since accomplished centralized dispatch, modeled to their particular needs.

Some, in our opinion, have done a great job, utilizing land line talk circuits which are confined to operations use. Others have not done so well. The tools,

especially communications tools, are not what they ought to be. In such cases effective control cannot properly be maintained unless the dispatchers resort to expensive long distance telephone calls.

Failure to provide a thoroughly dependable network of communications to flights and ground stations results in wastefulness. It also results in agonizing delays, and in what FAA's Halaby decries as "lack of candid information to passengers."

You mention National and Delta inaugurating transcontinental service from centralized dispatch, contrary to what some other trunks are doing. May we suggest that these plans are not predicated on TELPAK, but on ARINC lashups that are being given close scrutiny. We feel certain that the carriers are not married to non-establishment of west coast dispatch if their present plans are inadequate to maintain satisfactory operational control. A trial period will tell that story.

Recent testimony before Congress illuminated the growth of air traffic in the U.S.A. Aircraft operations have quadrupled since 1946 and they are forecast to do the same in the next 10 to 12 years. This growth has been achieved with virtually no expansion in the number of dispatch personnel, and in fact with fewer bases than 10 years ago. This has been accomplished by the ever-increasing productivity of the skilled, licensed dispatcher and through improved communications.

We suggest that if a real major "breakthrough" is to be achieved that will save the carriers money and at the same time provide stations, pilots and passengers with information that is fast, accurate and reliable, emphasis should be placed on providing the finest in communications in the airlines' nerve center, the dispatch office.

R. E. COMMERCE
President
Air Line Dispatchers Assn.
Arlington, Virginia

Comment on South Africa

To the Editor:

Your article on South Africa which I have just read in the July issue of *AIRLIFT* hits the nail squarely on the head and I want to congratulate you on such forthright journalism. I spent some time in South Africa last year and I came to conclusions similar to those you expressed.

Keep up your fine work, and I shall look forward to your next article on Soviet Russia. Personally, I think this country has been vastly overplayed and when you look behind the scenes, you find a particularly antiquated setup in spite of the few glittering "spectaculars" they succeeded in putting out once in a while.

JOHN H. FURBAY, Director
Air World Education
Trans World Airlines
New York, N.Y.

To the Editor:

I agree all the way with you regarding the Union of South Africa in your "En Route" for July.

Although I have never been there, I understand the situation is just as you

present it to your readers.

I have faith in the right coming forward. We are undergoing a tremendous revolution but by all the natural laws of law, economics, government and society we move forward not backward; although at times it doesn't seem so. One has to back off and look at the whole picture and not be immersed in his own little world.

Please give us more stories of your travels, they are extremely interesting.

W. L. (WIN) LEGGITT
Northwest Propeller, Inc.
Seattle, Washington

Jets at Milwaukee

To the Editor:

In your July, 1961, issue is an article (page 44) headlined *Jet Airport Status Report*. In the column headed *Airports Expecting Turbojet Service* you have Milwaukee listed as 1964. Milwaukee received its first jet service in July, 1961, when Northwest inaugurated a daily Boeing 720B flight to New York.

TOM FUEHRER
812 N. 12th Street
Milwaukee 3, Wisconsin

COMING

August

- Aug. 1-2—Airport Operators Council, board of directors meeting, Wash., D.C.
- Aug. 3-6—North Central States Airport Managers Conference, Mason City, Iowa.
- Aug. 22-25—1961 Wescon convention, Cow Palace, San Francisco.
- Aug. 28-29—Conference on Transportation Mergers, Northwestern Univ. Transportation Center, Evanston, Ill.

September

- Sept. 4-10—Society of British Aircraft Constructors, annual equipment exhibit, Farnborough, England.
- Sept. 6-8—Second Annual Cargo Handling Exposition, New York, Pier Nine.
- Sept. 12-14—National Assn. of State Aviation Officials, annual convention, Miami Beach.
- Sept. 12-15—ATA, joint airline-government inspection agency, facilitation meeting, San Francisco and Los Angeles.
- Sept. 13-14—Airwork International Operations & Maintenance Symposium, Millville, N.J.
- Sept. 27-28—ATA, subcommittees on ground equipment and maintenance facilities, Marriott Key Bridge Motor Hotel, Washington, D.C.

October

- Oct. 2-4—IRE, Canadian electronics conference, Automotive Bldg., Toronto.
- Oct. 3-5—1961 National Airports Conference, University of Oklahoma, Norman, Okla.
- Oct. 8-10—International Northwest Aviation Council, 25th annual convention, Spokane.
- Oct. 9-11—IREE, national electronics conference, Int'l. Amphitheatre, Chicago.
- Oct. 23-25—East Coast Conference on Aerospace & Navigational Electronics, Lord Baltimore Hotel, Baltimore, Md.
- Oct. 23-27—IATA, 17th annual general meeting, Sydney, Australia.
- Oct. 30-Nov. 1—Air Traffic Control Assn., 6th annual conference, Miami Beach.

November

- Nov. 1-3—Connecticut General Life Insurance Co., Symposium, the issues and challenges of air transportation, Hartford, Conn.

December

- Dec. 5-6—(Tentative) FAA, supersonic transport airworthiness conference, Wash., D.C.
- Dec. 5-7—NATC, annual meeting & NATCA convention, Statler Hotel, Wash., D.C.



Flight Propulsion

Convair 990 Hits Mach .97 During Speed Test Flight

SAN DIEGO, Calif.—Convair's 990 Coronado jet airliner recently logged speeds of Mach .97 during test flights over the Pacific.

This is the fastest true air speed ever attained by a commercial jet transport.

Powered by four General Electric CJ-805-23 aft-turbofan engines rated at 16,100 pounds thrust each, the 990 reached a maximum speed of 675 mph at 22,000 ft.

The high-speed test flight saw the 990 dive at Mach .97 from an altitude of 32,000 ft. to 22,500 ft. The flight was made to demonstrate a "cushion" between the operating speed and the airplane's capability.

In earlier tests, the 990 jet airliner passed a series of demonstrations designed to increase its maximum permissible landing weight. Ship 1 landed at Edwards Air Force Base at a weight of 192,000 pounds, 12,000 pounds heavier than the 180,000 pounds specified for the aircraft.

This performance will permit more flexible medium range operations, making possible a longer series of short stage lengths without refueling.

A medium/long range jet capable of operating from 5000-ft. runways, the 990 is designed to carry from 96 to 121 passengers. It is expected to cut transcontinental non-stop flight time by as much as forty-five minutes.

The 990's turbofan engines are equipped with the same G-E constant speed drives that have been proven in service aboard the turbojet 880.

General Electric Develops New Low-Cost, Lightweight Wooden Afterburner Crate

CINCINNATI, Ohio—Package design experts at General Electric's Large Jet Engine Department have developed a new low-cost wooden container for shipping J79 afterburners.

The new container, which was developed in conjunction with the U.S. Air Force, weighs only one-eighth as much as metal containers previously used.

Designed in the Product Support Section of the Large Jet Engine Department, the container weighs only 237 pounds, compared to 1800 pounds for the metal container. Lightweight and durable, the wooden afterburner crate meets all Air Force and Navy requirements.

Appreciable savings in shipping and material costs have been effected as a result of the new container, and need for keeping extensive records on non-disposable metal cans is eliminated.



Convair 990 Coronado jet airliner on high-speed test flight. CJ-805-23 powered aircraft flew at Mach .97, fastest true airspeed ever attained by a jet transport.

FIRST McDONNELL F4H PHANTOM II'S ARRIVE AT OCEANA NAVAL AIR STATION

NAS OCEANA, Va.—Five McDonnell F4H "Phantom II's" were recently transferred here from NAS Miramar, Calif., to join U.S. Navy Fighter Squadron 101. VF-101 is the second USN unit to conduct training with the Mach 2 all-weather fighter.

At Miramar, Fighter Squadron 121 has been training F4H pilots since February. The Navy will continue F4H training at both air stations, with the first operational squadron of "Phantom II's" slated for fleet service in the near future.

Reports from pilots and maintenance personnel at Miramar indicate that both aircraft and engine are performing extremely well.

The five fighters now assigned to Oceana are powered by twin General Electric J79-2 turbojets, rated in the

16,000-pound thrust class. Production F4H's now being delivered to the Navy use G.E.'s J79-8, a more powerful version of the "2."

Power for the aircraft's parallel operating electrical system is provided by two G-E constant speed drives, each rated at 20-kva capacity.

Destined to become the Navy's standard Mach 2 carrier-based fighter, the McDonnell "Phantom II" has already demonstrated its operational capabilities by flying to an altitude of over 98,500 feet and setting two world speed records. On September 5, 1960 an F4H-1 logged 1216.78 mph in a 500-kilometer closed-course run, bettering the former record by more than 400 mph. Three weeks later another F4H-1 set a new 100 kilometer world speed mark of 1390.21 mph.



Official photograph U.S. Navy
First of five J79-powered McDonnell F4H's arrives at NAS Oceana from the West Coast.



General Electric Studies Lift-fan Powered VTOL Craft for Retrieving Team

CINCINNATI, Ohio—A lift-fan powered VTOL transport which could become part of a "mother-daughter" team for retrieving valuable payloads is currently under study by the General Electric Company.

The new "daughter" VTOL aircraft would operate with a "mother" C-130 or equivalent, and provide global rescue of personnel and recovery of payloads up to 3600 pounds.

The daughter aircraft would have a gross weight of 13,000 pounds and a maximum speed in excess of 450 knots. General Electric X353-5 lift fans will power the aircraft. The lift fans would be installed at an angle of 10 degrees from the vertical centerline of the daughter aircraft to reduce downwash in the pickup area.



Drawing of G-E lift-fan powered "daughter" recovering a payload from ocean.

To begin a rescue mission, the two aircraft would take off separately. After reaching moderate altitude, the daughter aircraft would hook-up with the mother and be flown to the mission area. The daughter then would detach, descend, retrieve the payload, and fly back to the mother aircraft for reattachment and return trip.

During return flight to the base, the cargo or personnel might be transferred to the mother aircraft through a pressurized hatch. Upon reaching the landing area, the daughter would again separate from the mother, and the two would make separate landings.

The "mother-daughter" method of accomplishing search and retrieval missions takes advantage of the VTOL and high speed capabilities of the lift-fan powered daughter, and the long-range abilities of the C-130 transport.

In addition, the "daughter" will operate alone as an efficient short-range electrical aircraft.



Spotters on ground check air speed of HSS-2 as it breaks helicopter world speed record.

T58 POWERED HSS-2 RECAPTURES HELICOPTER RECORD FROM RUSSIANS

WASHINGTON, D. C.—A new helicopter world speed record of 192.9 mph was established May 18 by a U.S. Navy Sikorsky HSS-2 turbocopter over a three kilometer (1.86 miles) straight course at Windsor Locks, Conn.

Powered by two General Electric T58 gas turbine engines, the boat-hulled HSS-2 joins the fleet this year as a submarine hunter-killer.

The fastest speed previously flown by a helicopter was 167.09 mph by a Russian Mil-6, November 21, 1959 over a closed hundred kilometer (62 mile) course. On May 24 the Sikorsky HSS-2 reclaimed this record from the Soviet Union by flying a similar course at 174.9 mph. The new record is subject to confirmation by the Federal Aeronautique Internationale.

The HSS-2 is a key weapon in the nation's anti-submarine warfare defenses. Designed and developed as a weapon system with multi-mission capability, the HSS-2 is the first Navy copter able to detect, identify, track, and destroy enemy submarines.

The HSS-2 has "round-the-clock" operational capability. Amphibious hull, turbine reliability, integral search and attack equipment and record-breaking speed give it performance that far surpasses present piston-engine anti-submarine warfare helicopters.

The General Electric T58 powerplants, major contributors to this outstanding performance, each produce 1250 horsepower and weigh only 295 pounds. Operating on only one of its twin T58's, the HSS-2, at normal ASW mission weight, can continue to fly using the military 30-minute power rating.

The T58 also powers the Kaman HU2K, and Boeing-Vertol HRB-1. The CT58, civil version of the engine, powers the Sikorsky S-61 and S-62 and the Boeing-Vertol 107.

FOR FREE INFORMATION

General Electric Company
Section 206-38B, Schenectady 5, New York

- GED-4106, "F4H/J79"
- GED-4460, "HSS-2/T58"
- GED-6002, "CJ-805"
- GER-1704, "F4H Electrical System"
- GEA-6890, "Constant Speed Drives"
- GED-4509, "Search and Retrieval Mission"

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CLEAN JET FUEL is essential to safe jet aircraft operation. Today, all aviation fuels in current service may be provided the ultimate protection against fuel contamination. The new Warner Lewis 2-stage separator/filter eliminates jet fuel contaminants — free water and dirt. This new equipment developed by Warner Lewis Company, pioneer manufacturer of separator and filter



equipment for aviation refueling, delivers the cleanest fuel ever demanded by commercial or military aircraft. A Silent Servant of Safety, this equipment is installed at the fixed facilities and on refueler trucks and hydrant carts serving most of the world's major airports. It is approved and

in production for the U. S. Air Force under recent contracts. For further information, write Aviation Products Division, Warner Lewis Company.



WARNER LEWIS PROTECTS THE JETS



DIVISION OF FRAM CORPORATION
IN CANADA: FRAM CANADA, LTD., STRATFORD, ONTARIO

• Like a number of other airlines, Allegheny sells drinks at a buck a throw. Now it has added a smart public relations twist. Anytime a flight is delayed substantially on account of mechanical trouble, equipment distribution, etc., the captain is authorized to announce to passengers that he is inviting them to have a drink "on the house." There's no hard-and-fast rule on the length of delay, but a rough yardstick is 30 minutes. ATC delays don't count—or Allegheny would be giving away more drinks than it sells.

• Fabulous is about the only appropriate word to be used for William P. Lear Sr., the radio genius who founded Lear Inc., and who is always up to his neck in a hundred and one activities besides the original company. Currently it's a vast prefabricated housing project for Europe, a resort and golf club development on the southern tip of Italy, and a jet executive airplane.

Not the least fabulous item in the life of Bill Lear is his \$350,000 American-type ranch house, called Le Ranch, in Onex, a suburb of Geneva, Switzerland. The Swiss had never seen any-

thing like it. Few others have, either. Of course, there's a huge heated swimming pool and just about the world's most comprehensive hi-fi sound system, a notable feature of which is a group of three big loudspeakers in the woods back of the house. The music (sic) can be heard for miles.

Lear doesn't believe in clocks. If you want to know the time, there's a telescope in the middle of the living room, focussed east through the picture window. Far off in the distance is a church steeple. The naked eye couldn't find it, but the telescope brings into clear view a clock on the steeple. Only Lear could dream up that one.

• A group of 40 aircraft and airline executives, mostly from the U.S., rounded out the Paris Air Show in June by going on a two-day relaxation at Val d'Isere, a ski resort 6000 ft. up in the French Alps, three hours by car south of Geneva, Switzerland. The host was Georges Hereil, president of Sud Aviation, builder of the Caravelle.

And this diversion in the Alps may well be the start of a brand new game in the U.S.—a French bowling game

called "Petanque." All of the Americans, including United Aircraft's Bill Gwinn, Chuck McKinnie and Carlos Wood; Republic Aviation's Mundy Peale, John Ryan and Jim Murray; Douglas' Ben Marble; Pacific Airmotive's John Myers and Roy Bachman; General Electric's Neil Burgess and Ray Small; TWA's Oz Cocke and Northern Consolidated's Ray Petersen, took to Petanque like ducks to water.

It's a flexible game for two to eight people. All you need are two balls for each player (Hereil provided steel balls about three inches in diameter), and a "mark," which can be anything, a stone or small object. Winner of the coin flip throws the "mark" in any direction, just so it lands between 20 and 33 ft. from the throw line.

From then on it's a matter of getting closest to the "mark" and/or knocking out the other guy. The Americans have already ordered sets for shipping to the U.S., and all agreed that French bowling outranks horseshoes, regular alley bowling or almost anything else for excitement, flexibility and competition. The game can change with each throw.

Hereil's Party and Petanque . . .



HOST GEORGES HEREIL, Sud Aviation president, introduced Petanque (see story above). Here he blows Alpine horn for fishing contest.



BOWLERS INCLUDE Ray Petersen, head of Northern Consolidated Airlines, left; Neil Burgess, mgr. of General Electric's commercial engine operation.



READY TO ROLL is Mundy Peale, president of Republic Aviation. Jim Murray, Republic v.p., watches.



GOOD FORM is shown by John W. Myers, chairman of the board of Pacific Airmotive Corp.



WATCHING THE CONTEST are Carlos Wood, Sikorsky's engineering mgr., left; Roy Bachman, v.p. of Pacific Airmotive engine and products division.

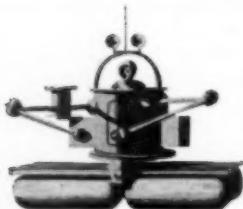


BALL IS THROWN by Ben Marble, Douglas Aircraft's advertising mgr., as Backman and Peale watch.

Lunar VTOL Vehicle. A rocket-propelled craft designed to collect lunar ore specimens.



Nuclear Space Ship. A Douglas design for a space ship with crew quarters and control rooms in the nose, nuclear reactor in the rear.



Lunar Service Vehicle. Travels like a "swamp buggy" on inflated rollers. Mechanical arms provided to handle outside chores.



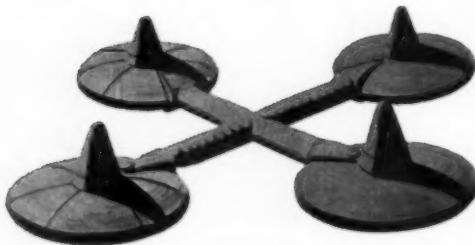
Nuclear Space Ship. A future, medium-thrust, nuclear-electric space ship for one-year interplanetary round trips (Martian and Venusian).



Douglas Thor. Designed as a military IRBM, this dependable missile is the workhorse of the Space Age.



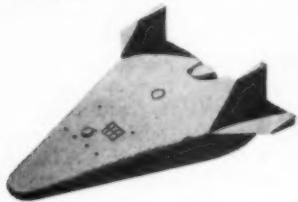
Saturn. First U.S. vehicle designed to put tons of payload into orbit... or onto the moon. Douglas-built second stage is as tall as a 4-story building.



Space Observatory. Sections of this Douglas-designed space station would be sent into space in rockets and be joined together in orbit.



Nuclear Space Ship. An unconventional design by Douglas with living quarters around the ring at the bottom. On landing, it would ease down, ring first.



Supply and Escape Vehicle. A compact re-entry vehicle to supply orbiting space stations or to return crews to earth.



Lunar Cargo Handlers. Would load lunar ore samples into containers to be towed back to earth by rockets.



Lunarmobile. Donut-shaped exploration vehicle to use rocket power in space and tractor treads on the moon's surface.

Eleven ways to outwit the law of gravity

When the Space Age dawned, Douglas was ready with specific proposals for space equipment either completed or in advanced stages of development. (Some appear above.)

These Douglas proposals were based on *realistic* estimates of the capabilities of men and materials. They are the valued dividends of the company's considerable experience,

gained from the design and production of 30,000 missiles and rockets. These include the Douglas *Thor*, an IRBM which has been totally successful in 86% of its tactical and space firings over the past two years.

Today, Douglas looks ahead to other exciting challenges from its firm position of leadership in the conquest of Space.

DOUGLAS

MISSILE AND SPACE SYSTEMS • MILITARY AIRCRAFT • D-8
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GROUND SUPPORT EQUIPMENT • AIRCOMB • ASW DEVICES

AIR TRANSPORT TRENDS



Equipment

More and more U.S. airlines are looking abroad for equipment. Mohawk officials have been to England and France, discussing the twin-jet BAC-111 and a small Caravelle. A Bonanza team goes next month to BAC, Sud Aviation and Fokker. National is interested in a small jet, is eyeing BAC-111 and Caravelle. Several U.S. manufacturers are considering small jet designs. But foreign planemakers definitely have the jump.

Traffic

Will Atlantic traffic decline next year? One sales expert predicts flatly that 1962 passenger total on scheduled flights will be 10% under 1961 unless airlines get busy and introduce promotional fares. Excess capacity, incidentally, is now showing up in other areas. A particularly large number of seats are available on planes operating between Europe and South East Asia.

Sales Promotion

Promotional fares have paid off for Bonanza. The local service line put in low-fare roundtrip excursions in April between selected points, and advertised them aggressively. Program made a substantial contribution to encouraging traffic results for first six months: A 22% increase in passenger-miles with only a 4.5% increase in available seat-miles.

New Look

Don't believe reports that United will sell the 41 Capital Viscounts. They won't be disposed of until at least the end of 1963 when the Boeing 727s that are on order become available. Viscount fleet is being refurbished.

New Orders

Air France is well pleased with the Caravelle. It will probably order more. At present, 33 have been ordered, all but six of which have been delivered. French observers wouldn't be surprised to see the final total number of Caravelles bought by Air France reach 50.

Conversions

Converted DC-4 Carvair prototype will make a world sales tour. Aviation Traders' nose-loading transport made its first flight at the end of June. The British company can supply a Carvair for \$450,000. Price will be less if used DC-4 market falls.

Cargo

British European Airways gets its first two Argosies this fall. Third will be delivered in January. The Armstrong-Whitworth cargo planes will enable BEA to retire all its DC-3 freighters early next year. Utilization of the Argosies will start at about five hours daily per aircraft. In the U.S., the Argosy is averaging nearly 10 hours in Riddle Airlines' Logair operation and Riddle expects to increase this to 13 hours (4200 hrs. a year) shortly.

Reservations

High cost of electronic reservations may not shut out the locals. Three of the "Big Four" U.S. trunks are now wooing the locals with attractive lease terms to rent capacity in their big computer systems. But local managements are taking a long hard look, particularly at the possible disadvantages of becoming too strongly tied to one trunk to the possible detriment of interline relations with others.

For a 14" x 10" lithographic print, suitable for framing, write Aviation Division . . . request Historical Series #6.



April, 1915 . . . Roland Garros' first victory with his specially armed Morane.

Early War Birds—THE MORANE N, "BULLET"

This French monoplane was used early in World War I for reconnaissance, light bombing, and as a "fighter." Uniquely streamlined for its time, it employed wing warping for lateral control and was powered by an 80-horsepower Le Rhône rotary engine to a top speed of nearly 100 mph. Endurance was 1½ hours. The "Bullet" is perhaps best remembered in connection with Roland Garros and his unsynchronized machine gun firing through the propeller arc. The propeller was fitted with steel deflector plates near the hub to protect it from those bullets which did not pass through. The arrangement had been tried earlier by another Frenchman, Eugene Gilbert, but abandoned. Garros perfected the deflector plates to the point where the device seemed worth trying.

On April 1, 1915, the chance came. Garros, on a solo mission to bomb a German railroad station, encountered an Albatros two-seater. He attacked, flying to cut off his adversary's retreat. The German observer fired back, but

Garros' new "flying gun" proved more accurate. Maneuvering his little ship and sighting down the Hotchkiss gun in front of him, he sent the Albatros down in flames. After this initial victory, Garros' success continued. By April 18, he had gained 5 victories—on one occasion taking on four enemy planes single-handedly. He was cited for the "Légion d'Honneur" and widely acclaimed in the French press as an "Ace" . . . probably the first such use of this familiar term.

On the same day as his fifth victory, Garros was forced down behind enemy lines, and the Germans learned of his "secret weapon." Spurred on by Garros' success, both sides soon developed completely dependable devices for synchronizing gun firing with propeller rotation . . . beginning a new era of aerial warfare and fighter aircraft. As for Garros, after more than two years of captivity, he escaped and returned to fight . . . only to be shot down and killed a month before the Armistice.



● PHILLIPS AVIATION MILESTONES . . . In 1935 Phillips sponsored high-altitude tests by Wiley Post, contributing much needed knowledge on performance in rarefied atmosphere. Today, a major supplier of high performance aircraft fuels, Phillips continues to lead in developing new and improved aviation fuels and lubricants.

INDUSTRY AT A GLANCE



MANAGEMENT

Shakeup at SAS—Plagued by financial troubles, Scandinavian Airlines System's board decided that a management change was in order.

Out went president Ake Rusck, whose handling of affairs has been criticized both in the Scandinavian press and within the company. Taking over on a temporary basis is 40-year-old Curt Nicolin, who has headed ASEA, Swedish electrical/electronics firm. Primary mission of Nicolin, who has enjoyed a rapid rise in Swedish industry, will be to restore SAS to economic health before returning to ASEA.

Contributing to SAS' difficulties are a heavy jet investment, increasing competition, growing restrictionism and high costs due to political pressure of maintaining facilities in each of the three owning Scandinavian countries. Loss in the last fiscal year was \$16.5 million. Recently the three governments and private sources pumped another \$40.5 million into the company.

The management shakeup also brings back for a greater measure of policy influence Per A. Norlin, founder and one-time president, who has had a backseat on the board for some years.

LABOR

Foot in the door—James R. Hoffa finally has a long-sought foothold in the air transport industry.

His International Brotherhood of Teamsters ousted the International Assn. of Machinists at Western Air Lines and now represents some 550 mechanics and ground personnel. Previously the Teamsters had won votes only at Pan American's Cape Canaveral facility (clerks) and at Flying Tigers (stewardesses).

Other airlines are already bracing for the Hoffa attack. He has been quoted as stating that it is only a matter of time until his union is in all the carriers. First attention is expected to be given to those which recently have had labor troubles. Indication that the heat is on: H. J. Breen, long-time secretary-treasurer of Flight Engineers International Assn., is on leave to the Teamsters and is heading airline activities.

Result of the Western election was: Teamsters, 240; IAM, 248; abstentions, 30.

EQUIPMENT

Biggest of big jets—As the air transport market in general shifts its emphasis into the short/medium range jet field, the builders of the bigger editions of long-range, intercontinental turbines, Boeing Co. and British Aircraft Corp., were not to be left out. In the midst of the new sales efforts on their short-

range 727s and BAC-111s respectively, they firmed up some solid specifications for their overwater contenders.

Boeing, with eleven orders in hand for its 707-320B, pegged the gross weight at 317,500, passenger capacity at 186 (all economy) and fuel capacity at 23,815 gals. It holds orders from Pan Am (5) and TWA (6).

British Aircraft Corp., with 52 firm orders for VC-10s or Super VC-10s, has finalized specs for both versions. The "standard" will gross 299,000 lbs., carry 21,618 gals. of fuel and accommodate 150 passengers. The Super will gross 322,000 lbs., carry 22,970 gals. fuel and 180 passengers. BAC orders are: 45 from BOAC of which 15 are standard and 30 Super; British United (4) standard and Ghana Airways (3) standard.

NEW ROUTES

Independents agree—Two British independent airlines have decided they have nothing to gain by fighting each other. Instead, they are joining forces in their fight against government-owned British European Airways.

Cunard-Eagle, fresh from its victory in getting a transatlantic route, and British United Airways reached a "sphere of interest" agreement. They are asking the Air Transport Board for permission to serve about 40 routes where BEA enjoys a British monopoly, and have decided not to oppose each other's applications.

Service between London and New York, in competition with BOAC, will be opened by Cunard-Eagle in May 1962 under a license granted by the ATB. One round-trip daily will be flown. Company will use Boeing 707s powered by Rolls-Royce Conway bypass engines.

DIVERSIFICATION

Branching out—In a major diversification move, Allegheny Airlines is buying a 50% interest in National Car Rental System, the 12,000-car St. Louis-based firm.

The deal involves a major expansion of the National system which now ranks No. 3 behind Hertz and Avis, accounting for well in excess of 10% of the business. Until now predominantly a franchise type operation, National will emphasize system-owned fleets in its expansion.

Although financial details await formal approval of the agreement by National stockholders, Allegheny's investment is reported to involve about \$250,000 for which it will receive 25,000 shares of National stock.

"The S-61L will cut our seat mile costs by half"

"The speed and capacity of these new twin-turbine helicopters will help us reduce our direct seat-mile costs by one-half." That's how C. W. Moore, Executive Vice President of Chicago Helicopter Airways, sums it up as this fast-growing airline readies for its new 25-passenger Sikorsky Copterliners to be delivered this fall. CHA began passenger service only five years ago, and late this year it will carry its one-

millionth passenger. Last year it carried 309,000—a 51% jump over the previous year. The Sikorsky S-61L, first helicopter ever designed specifically for scheduled passenger service, provides turbine smoothness... airliner comfort... twin-engine reliability... plus all-weather flight capability. For more cost and operating facts, simply call or write Sikorsky.

SIKORSKY AIRCRAFT Stratford, Connecticut
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Will U.S. Get A New Class Of Air Carriers?

Proposed "third level" of airlines would improve service to small points, cut subsidy

SA "THIRD LEVEL" of scheduled air service in the making for the U.S.? There are signs that it may be. The first application is already on the Civil Aeronautics Board docket for expedited hearing.

The third level would be added to the present domestic trunk system and the widespread local carrier system.

It would provide service to small stops abandoned by the locals and to other small towns which cannot support a DC-3-or-better scheduled air service. It would be subsidized. But the subsidy cost would be considerably lower than that for DC-3s.

The third level would use smaller airplanes—Aero Commander, for example—or perhaps even single-engine craft in some areas. Only one pilot would be used.

Congressmen in the Plains States are seriously concerned about the lack of public transportation. Many rail lines have been abandoned. Buses and trucks are slow. The local carriers which were launched to provide service to small towns have been getting out of some points, or they want to get out because of low traffic.

CAB's use-it-or-lose-it policy states that each city must originate an average of five or more passengers daily, and that each segment generate an average of seven passengers on all flights, within a reasonable trial period, if air service is to continue. Many towns can't generate that much. Yet they need and want some type of service.

It is recognized in Congress that putting DC-3s or even larger equipment into small towns can run up the subsidy bill. On the one hand, Congressmen resent efforts of local carriers to abandon service, but they also appreciate the cost factor. So does CAB.

Indication of the interest in serving smaller communities is an application filed with CAB by C. E. Walts d/b/a Hi-Plains Airways, Hill City, Kans. The company proposes to operate 10 Aero Commanders, either leased or bought, over routes from Bismarck, N.D. on the north to Kansas City, Mo. on the south. The Aero Commander will carry six passengers.

The routes include some points and part of a segment that Frontier Airlines wants to abandon because available traffic will not support a DC-3 operation.

That this proposal is of more than passing interest to CAB is seen in the Board's action granting Hi-Plains' request for an expedited hearing.

Here are Hi-Plains' proposed routes:

1. Between the terminal Denver via intermediates Greeley, Colo., Sidney, Scottsbluff, Alliance, Chadron, Gordon, Valentine, Ainsworth, O'Neil, Norfolk, Columbus, and Fremont, Neb., and the terminal Omaha.

2. Between the terminal Denver via Fort Morgan and Sterling, Colo., Imperial, McCook, Holdredge, Kearney, Hastings, Fairmount, York, Lincoln, Neb., and the terminal Omaha.

3. Between the terminal Hill City, Kans., via Russell and Great Bend to Wichita, and beyond the terminal Hill City via McCook, North Platte and Valentine, Neb., Pierre and Mobridge, S.D., and the terminal Bismarck.

4. Between the terminal Hill City via Norton, Oberlin and St. Francis, Kans., Yuma and Akron, Colo., and the terminal Denver, and beyond the terminal Hill City via Norton, Phillipsburg, Smith Center, Mankato, Beloit, Concordia, Clay Center, Manhattan and Topeka, Kans., to Kansas City.

Hi-Plains estimates that its annual revenues would be about \$984,000.

Some local service carriers are watching this case closely. If CAB favors this type of service, some local lines might well organize separate divisions to provide single-pilot scheduled flights with "light" airplanes.

In addition, there would be opportunities ahead for well-financed air taxi operators to undertake such service. The "third level" would also mean additional sales for aircraft manufacturers, fuel companies, suppliers—and more opportunities for pilots.

Local service lines in 1960 served 536 cities. Some 336 of these received their only service from locals. CAB analyses showed that 113 cities last year generated below the minimum number of daily passengers required by the use-it-or-lose-it policy.

Passenger Slump Obscures Airfreight Gains

Results for first five months show gains over 1960 despite drop in passenger traffic. Outlook for second half is even better.

By ERIC BRAMLEY

DOESTIC AIRFREIGHT in the U.S. promises to have a boom year.

Somewhat overlooked amid the pessimism that has, until recently, surrounded the passenger business, freight has been edging up quietly and will approach the half billion ton-mile mark this year for trunks, locals, Flying Tigers and Riddle.

In the first five months of 1961, these carriers increased their freight traffic by almost 8.5%. In contrast, trunk passenger-miles sagged 3.1% below the same 1960 period. Passenger travel rallied in June (up 3.8%) and freight continued its upward move. Although industry freight totals are not available for the month, American Airlines reports a record 11,377,000 ton-miles in June, up 24% from last year. AA's increase in May was 19%.

In 1960, domestic freight reached 419.3 million ton-miles. Prediction for this year is a 14.4% increase, which would put the total at about 480 million. It may go even higher.

Last year no index

Here's what happened last year and what the trend looks like this year: In 1960, freight got off to a fast start and the six-month result was good. Then, hit by recession, business dropped, producing an unusual result for the year: The second half had been no better than the first half. Normally, the last six months are much better. The year ended with a 9% increase, way under the 17.5% that had been forecast by Air Cargo Inc., the airlines' ground service organization.

In the first five months of 1961, freight was bucking the high ton-mile totals of the same 1960 period and still showed an 8.5% growth. Gains during the remainder of the year will be considerably larger, because they compare with the soft period of 1960.

Among reasons cited for this year's healthy growth are (1) the upward turn in the economy results in a need for speed in the building of inventories, (2) jet speed is attracting traffic, (3) airline management, scratching for revenue in the face of soft passenger business, is giving more attention to development of airfreight.

All-cargo fleets of the trunks have been increased substantially during the past several months. One observer estimates that the expansion has been as high as 150%. And capacity receives another big boost when the Tigers put the Canadair CL-44 swingtail turboprop into service.

Present freight traffic, although growing at a healthy rate, is still not sufficient to fill this increased capacity. It seems likely, therefore, that some downward rate adjustments will come before too long.

No agreement on rate policy

The Civil Aeronautics Board has ordered carriers to show cause why the Board's order setting minimum freight rates should not be rescinded. This order establishes the minimum rate at 20¢ a ton-mile for the first 1000 ton-miles, declining progressively with volume increases to 16.25¢. Directional rates eastbound and northbound are even lower.

American Airlines favors rescinding the order, but most other carriers want some type of minimums to prevent rate wars. But even if minimums are retained, some reductions are likely, because at present very few rates are pegged at the minimums. Flying Tigers, for example, has been working on new tariffs for two years in connection with the introduction of CL-44s.

Indicative of the growing interest in cargo is the fact that CAB has just awarded a \$47,800 contract for an air cargo cost finding study. A detailed breakdown of such costs has never before been attempted on an industry-wide basis. Special attention will be given to the question of future cargo rates. The study will be conducted by Systems Analysis and Research Corp., which has offices in Boston and Washington.

CAB notes that volume of potential air cargo seems to be sensitive to given rates. "Rate policies, structures and levels will therefore have an extremely important influence on the future course of the air cargo industry," it adds. "The study will provide cost-finding information to the CAB for consideration in making policy decisions on rate and other air cargo problems . . ."

Freight Up—Passengers Down

U.S. Domestic Trunks

Month	Freight Ton-miles (000)		% Change
	1960	1961	
January	22,627	25,855	+14.3
February*	25,309	23,050	-8.9
March	25,999	31,108	+19.7
April	25,517	27,723	+8.6
May	25,544	31,678	+24
12 Months**	299,208	335,365	+12.1

Rev. Pass. Miles (millions)

Month	1960	1961	% Change
January	2404	2338	-2.7
February	2124	1808	-14.9
March	2273	2386	+4.9
April	2493	2447	-1.8
May	2431	2367	-2.6

* Strike period

** Ended May 31, 1960/61

Delta Pioneers Punch Card Purchasing

Use of IDP materials control system for DC-8 and 880 provisioning is prelude to industry adoption

By JOSEPH S. MURPHY

A PROMISING NEW TOOL for more efficient airline management, better known to the punch card experts as the "ATA Spec 200 Integrated Data Processing System," is successfully weathering its most exhaustive tests at Delta Air Lines.

Once fully developed, it will give airline executives and their staffs a modern, fast and accurate control over the thousands of spare parts they buy and the millions of dollars they spend on them annually.

Actually, the Spec 200 system is beyond the test stage at Delta. In fact, Delta is a few steps ahead of the Spec 200 system development by the Air Transport Assn's supply committee, but it is closely tailoring every step it takes to the needs of a truly industry-wide system.

Delta is by no means the only airline using the system. None, however, has progressed as far as Delta in the automation of materials control. One of the big reasons is that

its top management, as far back as 1957, adopted the principles of computer operation, ordered an IBM 650 and directed its staffs to develop a system and put it into operation.

Under the overall direction of comptroller and treasurer Robert Oppenlander and the more immediate supervision of a stores man turned IDP systems expert, Marvin McMahon, the system has expanded to the point where more than half of Delta's 95,000 items of inventory are in the automated system.

The 650 arrived in December of 1959 and the following month Delta began its first processing. One of the first jobs tackled, and one which McMahon feels might well have bogged down under the sheer weight of paperwork if done manually, was the initial provisioning for both the Douglas DC-8 and Convair 880 and their engines.

Today, in addition to these four key jet suppliers, Delta

The adoption of a modern materials control system is not something that is confined to the workings of one department of an airline. Its effects, whether advantages or disadvantages, are widespread. At Delta, for example, here are the names and titles of key personnel who come in direct contact with IDP materials control:

Management

Asst. v.p.-technical operations C. B. Wilder
Comptroller and treasurer R. Oppenlander

Treasury

Asst. treasurer-accounting H. H. Saxon
Mgr.-cost accounting M. O. Galloway
Asst. treasurer-treasury J. R. Howell
Accounts payable supervisor W. F. Scott

Purchasing

Purchasing agent K. T. Wilson
Senior buyer J. D. Dunn

Stores

Supt of Stores Wm. L. Miller
Manager-material control F. C. Fitch
Manager-physical stores E. L. Elliott
Supv office of receipt W. B. Suggs
Foreman-shipping/receiving D. M. Mashburn

Technical Operations

Manager-planning H. T. Fincher
Manager-production control Roy M. Rucker

Computer Program

Manager-computer research F. M. Heinzmann
Manager-EDP control programs M. R. McMahon
Manager-data processing E. R. Bennett
EDP analysts H. G. Duffer,
M. K. Player and J. Culpepper



Oppenlander



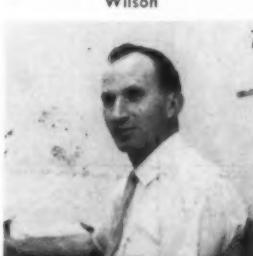
McMahon



Wilson



Miller



Rucker



Player, Bennett
and Culpepper

is "on Spec 200" with three other firms—Sundstrand (DC-8 constant speed drives); Airwork Corp. (aggressive Millville, N.J. engine overhaul agency and accessory distributor) and, Durham Aircraft, a major hardware supplier. Ultimately, Delta expects to have about 75% of its suppliers on the system.

Essentially, the system uses punch cards to replace the multi-copy purchase orders and far-flung files, follow-up records, and other mountains of paperwork it takes to operate an airline purchasing and stores activity.

As Bob Oppenlander expresses it, "It makes it possible for management to have the vast volume of paper screened rapidly and then to administer the operation effectively and currently by exception."

Too much paper heretofore

"In the past it was a physical impossibility to verify every piece of paper for inadvertent errors or unreasonable orders. Provisioning people, sometimes the airlines and sometimes the supplier's, often duplicated purchases of the same parts needed in different systems of one or more aircraft. Previously, this didn't show up until after the purchase was made, if ever. Now IDP prevents this by screening for matching part numbers in new and old fleets and inventories."

The Spec 200 system takes stores people out of the accounting business and puts them back in provisioning, says Wm. L. Miller, Delta's supt. of stores. In stores alone, Miller estimates the new system saves the airline about \$80,000 a year.

If a special status report is needed on a particular supplier, the automated system comes up with the results in hours instead of days. Recently Delta had occasion to review the 720-item list of parts it buys from a single electrical accessory manufacturer. The information was compiled in 1½ hours. Manually it would have taken a day and a half of research and another half day to prepare a report.

It used to be that Delta assigned 15 or more people for three days once a year to come up with a complete financial summary of inventory by quantity and unit prices. Now with the stock status report, the automated system provides a running balance on a routine basis. This balance is matched against physical inventory count cards which are fed into the system on a routine cycle basis.

In the relatively short period of time which IDP has been in use at Delta, numerous key reports have been developed to give both management and operating departments the benefit of its improved efficiencies. Following are major examples:

Rotable Stock Status Report—Weekly; about 10 copies five to Supt. of Stores for heads of physical stores, materials control, document group, research section and the foremen shipping and receiving. Four go to production control and one to purchasing. Requires 2 hrs. on 650, 7 hrs. overall.

Expendable Stock Status Report—Same as above, but for expendable (repairable and non-high value) stock. Takes 8 hrs. in preparation, two passes through 650—4 hrs. for reorder notices and 10 hrs. for stock balance report.

Commitment Report—Weekly; distribution same as above plus copies to Treasury accounts payable (1) and Purchasing agent (2).

Report lists outstanding purchase orders including new stock items and repair orders. Takes 5 hrs. on 650 for master report weekly. A midweek supplement takes 12 hrs. in preparation and 2 hrs. on computer.

Part Number Change Report—Weekly; for stores and production control; takes 2 hrs. to prepare, 3 hrs. on computer and 6 hrs. for new document preparation—new balance cards, locator tab cards, commitment cards, and

A complete report on expendable stock status, involving some 50,000 items, can be had in 18 hours. Follow-up on supplier deliveries used to be a perpetual headache involving a myriad of files in purchasing, stores and accounting. Now the system not only pinpoints items which are 30 days past due, but turns out a follow-up card which can be mailed directly to the supplier without further ado.

Fast answers from suppliers

It's Delta's experience that, in most cases, this routine action brings a return notice from the supplier that the shipment is on its way.

And management gets the fastest, most accurate check it has ever enjoyed on spare parts pricing. One weekly

TRANSACTION				SUPPLIER	CUSTOMER	RESERVED	ORDER NUMBER	PART NUMBER	KEYWORD	QTY/PRICE	QUANTITY ORDERED	UNIT PRICE	DISCOUNT	SPECIFIED SHIPPING DATE	SHIP TO	SP. HANDLING	ITEM NO.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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bin labels for Atlanta and line stations. This is a mechanical computer part change updating system and its use by Delta is unique to the airline industry.

Weekly Activity Report—A straight line listing by company part number order of all input transaction cards (an 80-80 card listing). Copies to Stores material control and research sections and to production control for provisioning analysts and shop planners. Note: In addition, a weekly stock report for Miami and Dallas and a weekly activity report for those stations (80-80 listing) also are prepared in Atlanta.

Expendable Activity Summary Report—Quarterly; same distribution as weekly. Summarizes activity in company part number sequence giving usage data by month for the current six months as well as the preceding two quarters.

utable Activity Summary Report—Quarterly; distribution same as weekly; gives Atlanta base activity by shops including (1) part numbers with no activity; and (2) part numbers with total number of transactions, credits, issues or scraps. For each line station, report shows amount of (1) activity and no allocations; (2) allocation and no activity; and (3) allocation and activity.

Compare & Advise Report—Weekly; 2 hrs. preparation, 1 hr. computer and 2 hrs. listing reports. Goes to purchasing, stores and production control. Accepts supplier changes

to Spec 200 order cards, updates computer files to latest condition of sale and reports out the condition which changed—price, date, part number, delivery, etc. Also updates and reports changes from suppliers on revised procurement data cards and reports changes if no orders are involved. This is essential program to get maximum mileage from Spec 200.

Management Exception Report—Monthly; for department heads and executive management; lists (1) price increase by part number and (2) outstanding commitments (purchase orders) by month and "by month due" in dollar totals; (3) number of purchase orders and status of order, expedite or routine, and by buyer; (4) quantity and dollar value of each part number which suffered an inventory adjustment; (5) outstanding purchase orders by number and supplier which are delinquent; and (6) outstanding "expedite" purchase orders which are delinquent.

Manufacturers Line List—Master issued quarterly with an accumulative addendum produced each week. A 95,000 part number listing in manufacturer part number order but with company part number where assigned; gives key word description of unit, and manufacturer's code (actual manufacturer who controls part, not necessarily the supplier).

Copies go to each main Atlanta shop, hangar overhaul areas, main line stations, plus each administrative control office in Atlanta including accounting and purchasing.

them and to recommend ways to cure them.

The problem of communications (words as well as understanding) between groups and departments in the development of an IDP system is critical, says McMahon. The naming of a coordinator with the power to act was Delta's answer to this problem and one that McMahon strongly recommends to any other airline embarking on such a program.

Company part numbers a must

To solve problem No. 2, Delta adopted a company part number system along the same lines envisioned by the ATA supply committee hopefully for industry-wide adoption some day. The heterogeneous mixture of alphabetical

ORDER CODE	SUPPLY CODE	QUANTITY	DELTA PART NUMBER	PURCHASE ORDER NO.	SHIP METHOD	MANUFACTURER PART NO.	KEYWORD	SUPPLIED SUPPLY UNIT	SUPPLIED LIST PRICE	%	SA 80	SHIP DATE
2782	05600	91	L0004	10	2	EA	2	EA	4378540	15051	YRC	02
PURCHASE ORDER NUMBER				SUPPLIER		DELTA ORDER QUANTITY	SUPPLIER ORDER QUANTITY	SUPPL. UNIT	DISCOUNT	DAY	MON. YR	SHIPMENT
						14	17	58 59	60 61	67 68	69 70	TERMINATOR
IMPORTANT REQUEST FOR INFORMATION CONCERNING ABOVE PURCHASE ORDER												
B3259				MANUFACTURER PART NUMBER		STATOR		KEYWORD				
1						B3259						
2				43 44		43 44		12				
3				AUTORIZATION FOR PART NUMBER CHANGE CHECK APPROPRIATE BOX BELOW:		INTERCHANGEABLE		X				
4				<input type="checkbox"/> INTERCHANGEABLE		<input type="checkbox"/> NOT INTERCHANGEABLE		X				
5				REFERENCE				X				
6								X				
7								X				
8								X				
9								X				
PURCHASE ORDER FOLLOW-UP												
Delta												
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80												
SUPPLIER CODE SUPPLY UNIT QUANTITY DELTA PURCHASE ORDER NUMBER SHIP METHOD MANUFACTURER PART NO KEYWORD SUPPLIED SUPPLY UNIT SUPPLIED LIST PRICE %												
Lewis 2394												

AUTOMATIC FOLLOW-UP on late deliveries is turned out by system, ready for machine addressing and mailing to the delinquent supplier.

and numerical designations used by different manufacturers obviously are indigestible in a computer system and eventually some standard has to be set.

Delta's 9-digit part number tells what system the part is used in (per ATA Spec 100), in what airplane, whether it is a rotatable (capital) item, what its inventory number is and finally, by adding two digits, the purchase order number. With this ideal arrangement, the company part number is always part of the purchase order number.

Today the demands on Delta's IBM 650 have grown to the point where they slightly exceed one working shift. Higher capacity electronic accounting machines (IBM 1401) are now being planned and by early 1963 the carrier expects to convert to the IBM 7074 computer in conjunction with the adoption of Sabre reservations system.

In addition to materials control, Delta uses the 650 for a variety of other jobs. Some examples: semi-monthly salaried employee payroll uses 16 hrs./mo.; flight personnel payroll, 16 hrs./mo.; flight profit and loss report, 7 hrs./

mo.; hourly employee payroll, 7 hrs./mo.; ticket distribution report by station, 10 hrs./mo. and employee retirement income statement, 25 hrs. once a year.

Although Delta has progressed farther than most airlines into IDP, it is not entirely new to others. United was one of the pioneers and has adopted the system in part. So has Braniff. Among international flag airlines Swissair, Sabena and Air France are actively using it.

But even greater activity in this area is coming within a few months. Eastern is now in the process of change-over. TWA begins its transition in September and Pan American later in the year.

Ultimately all major airlines will have to make the change. Efficiency demands it. And when that time arrives, the experience of Delta Air Lines, however briefly related here, will be well worth considering. Says Delta, "As more and more airlines and vendors participate, the Spec 200 system program will become a better, more productive management tool for all." ■

Next Year Delivery Is 748E's Forte

By ANTHONY VANDYK

WHEN a manufacturer talks about a turbine transport with a direct operating cost of under two cents per seat-mile for a 200-mile stage, even the most apathetic operator is bound to sit up and take notice. Britain's Hawker Siddeley Aviation is doing more than talking—it is offering an aircraft to do just this and to do it next year. The model in question is the Avro 748E, a development of the Avro 748 Dart-powered twin-engine transport which vies with the F-27 and Herald as a DC-3 replacement.

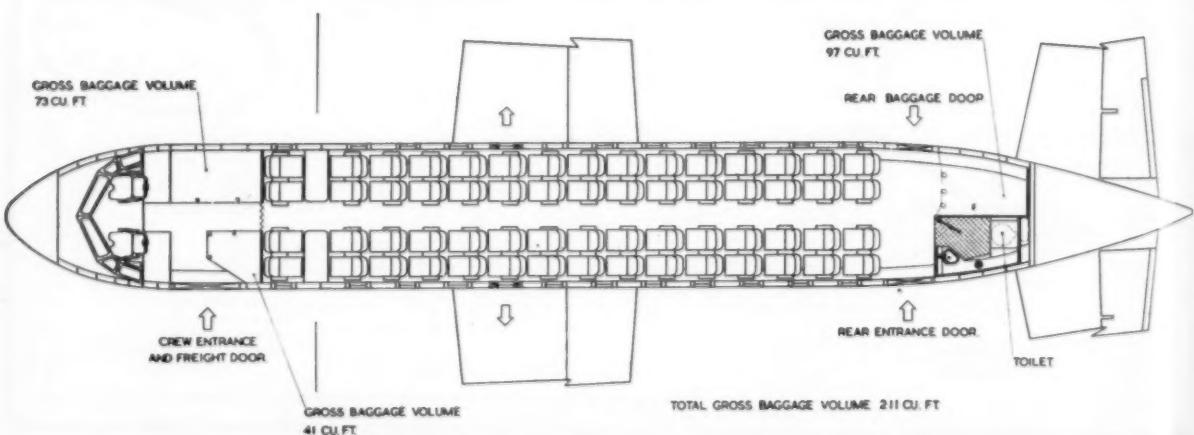
By stretching the Avro 748's fuselage six feet and using the 1910-shp RDa7 version of the Dart, the 748E is able to carry a payload of 12,000 lbs. for 200 nautical miles. This 12,000-lb. payload can comprise 60 passengers in seats with a 29-inch pitch, not by any means objectionable in the current airbus era. It is for the 60-seat version that Hawker

Siddeley Aviation talks about a direct operating cost of 1.76 cents per seat-mile or \$1.04 per aircraft-mile.

Although the 748E is a versatile aircraft and can carry a payload of 7700 lbs. for a stage length of 1000 nautical miles, most prospective purchasers will be interested in it for shorthaul work. Actually the 748E forms part of a family of 748 aircraft, complementing the original Series 1 with the Dart RDa6 and the Series 2 with the RDa7.

Dimensionally the Series 1 and 2 are identical. The Series 1, which has been flying since mid-1960, is designed to provide maximum economy of operation over short sectors from airfields at low altitude. The Series 2 can operate from high-altitude airfields in high-temperature conditions or over longer sectors without restrictions.

The reason for Hawker Siddeley Aviation's decision to



FUSELAGE STRETCH of basic 748 produces this 60-seat version designated the 748E.

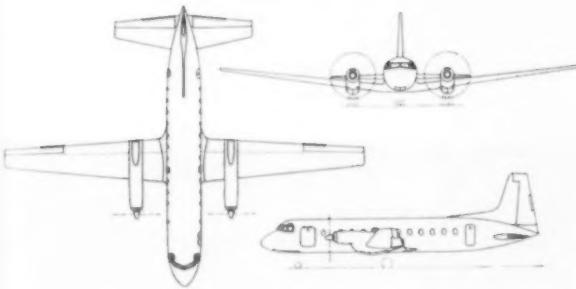
AVRO 748E production underway at Hawker Siddeley's Manchester, England plant.

offer the Avro 748E is that, in many cases where traffic conditions permit and where airfield requirements are not so stringent, operators have expressed a preference for an aircraft carrying a greater payload and having a larger internal volume than the Series 1. These operators said they would be satisfied if the bigger aircraft had the same general performance level of the Series 1.

Competitive price-wise with the F-27 and Herald, the Avro 748E is likely to widen the market for the 748 family. At the moment sales involve 21 aircraft. The only non-British carrier to have ordered the 748 at this writing is Aerolineas Argentina. But several important contracts are under negotiation and Hawker Siddeley Aviation has decided to build at least 60 at its Manchester plant. Deliveries start later this year. In India a military version of the 748 is being produced under license for the Indian Air Force.

One reason that the Avro 748 should be a success is the fact that the aircraft uses proven engines and equipment. It has no gimmicks. The circular-section fuselage and two-spar wing are of uncomplicated fail-safe design and construction. Each wing half contains an integral fuel tank. A 2500-psi hydraulic system operates the gear, nosewheel steering and brakes. The flying controls use no boost.

With a cruise speed of a respectable 245 knots, a field length requirement of under 4000 feet and an outstanding operating economy, the latest version of the Avro 748 will arouse interest among operators the world over. ■



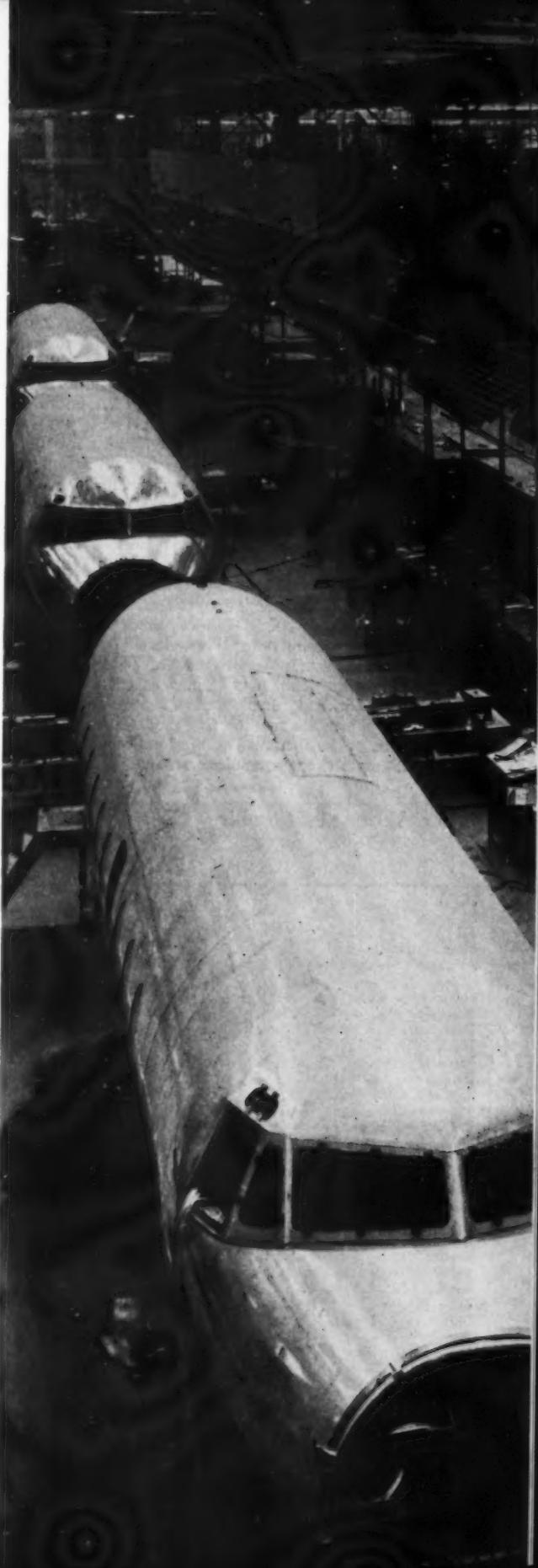
Avro 748E Highlights

Overall Dimensions

Length	73 ft. 0 in.
Span	95 ft. 0 in.
Height (above ground)	24 ft. 10.26 in.
Fuselage diameter (external)	8 ft. 9 in.
Wing area	795 sq. ft.
Aspect ratio	11.352
Taper ratio	0.388
Landing gear track	24 ft. 9 in.
Wheelbase	23 ft. 1 in.
Fuel Capacity	1140 Imp. gals.

Performance (Int'l Standard Atmosphere)

Maximum take-off weight	40,100 lb.
Take-off field length required at sea level	3,900 ft.
Rate of climb at sea level, both engines at maximum recommended power	1,380 ft./min.
Service ceiling (100 ft. min.) both engines at maximum recommended power	26,000 ft.
Cruising speed at maximum recommended power at 38,000 lb. at 20,000 ft.	245 knots
Payload/range performance with full SBAC allowances:	
Range with max. payload (12,000 lb.)	200 n.m.
Payload for 1000 n.m.	7,700 lb.
Landing distance from 50 ft. at sea level at maximum landing weight (38,500 lb.)	2,290 ft.



El Al, 'Short-Year' Airline, Is 365-Day

LOD, ISRAEL—For El Al the year has only 270 days. That's the way officials of the Israeli airline describe the effect of the Jewish Sabbath on the airline's operation.

Schedules must be so arranged that no aircraft arrives or leaves Israel during the 24 hours from dusk on Friday until dusk on Saturday. This schedule shuffling results in the loss of the equivalent of 95 days each year.

Despite the 270-day year El Al gets higher utilization from its aircraft than most competitors. During the summer months Bristol Britannia utilization averages over 11 hours daily. Last year the average daily utilization for the four turboprop transports was no less than 9.1 hours.

For its Boeing jet fleet the airline has set a target of 4000 hours' utilization per aircraft each year. The Israeli carrier has bought three Conway-powered 707s and two 720Bs with P&W JT3D engines. It is probable that a sixth Boeing jet will be ordered within the next few months.

Although El Al received its first two 707s this spring the airline was able to inaugurate jet service across the Atlantic under an arrangement with Brasil's Varig that was beneficial to both carriers. Varig had spare 707 capacity and El Al needed it to get started with jets.

Because the Varig 707 is Conway-powered it provided an excellent opportunity for crew familiarization. Each flight crew member now serving aboard El Al's own 707s accumulated some 100 hours time as an observer on Varig's New York-Lod flights earlier this year.

El Al specifications for the 707 and 720B closely resemble those of Lufthansa. The German airline has given the Israeli carrier considerable assistance in its jet pro-

gram, including the training of flight crews. Later this year a Redifon Boeing simulator will be installed at Lod airport adjacent to a Britannia unit, also by Redifon.

A 707 cabin mock-up has been in use for several months at Lod for training cabin personnel. A similar mock-up has been in use for several years for Britannia training.

El Al has always made the best possible use of the performance of its equipment. With special techniques the airline was able to fly the Atlantic non-stop in both directions when its competitors were having to set down for fuel. To exploit this operation El Al advertised "no Goose, no Gander" which won acclaim throughout industry.

A 5500-mile nonstop

With the 707 El Al has introduced a flight which permits full advantage to be taken of the excellent range of the big Boeing jet. Once a week a flight is operated non stop from New York to Israel, a distance of some 5500 miles. The Israeli airline claims the flight is the longest scheduled non-stop flight in civil aviation.

El Al is keeping secret its plans for the 720B. By ordering the "Dash 3" version of the JT3D engine it will have an aircraft with particularly good airfield performance.

It seems likely that the 720Bs will be used to open a new route to West Africa where several nations have trade ties with Israel. El Al may help some of these countries establish their own airline. The 720Bs also will be used to replace several Britannia services from Israel to Europe and will back up the three transatlantic 707s.

Another projected 720B operation is the reopening of

Three Years of Britannia Operation by El Al

Monthly Averages
1958 1959 1960

Flight hours (fleet total)	596	883	1082
Average daily utilization	5.5	7.2	9.1
Landing (fleet total)	153	255	272
Average ft/hrs landing	3.9	3.9	3.98
Number of departures	118	203	245
Delays through mech. incidents	16	14	18
Delay rate per 100 departures	13.1	7	7.6
Total delay time in hours	88:20	55:54	38:15
Percentage hours delayed	14.8	6.3	3.5
Delays per 100 ft/hrs	2.7	1.6	1.7
Average delay time	5:30	3:54	2:29
Featherings in the air	0.75	3	1.5
Premature engine removals	2	3.6	1.7
Eng. removals per 100 ft/hrs	0.35	0.41	0.16
Returns to ramp	0.92	1	1.25
Interrupted flights	1.16	1.33	1.08
Cancelled flights	—	0.4	0.58
Log entries (flight defects)	208	351	319
Flight defects per 100 ft/hrs	34.8	39.8	29.4
Maint. & inspection defects	313	652	778
Ground defects per 100 ft/hrs	52.7	73.8	71.9
Total defects	522	1003	1097
Defect rate (per 100 ft/hrs)	87.6	113.6	101.3
Number of check I performed	4	5	6.2
Number of check II performed	1.3	2.3	2.3
Number of check III performed	0.41	0.33	0.33
Number of check IV performed	0.25	0.25	0.41
Premature component removals	183	206	238
Component removals per 100 ft/hrs	31	23.3	22.1
Component removals per 100 defects	58	20.5	21.8

DaySuccess

El Al's own service to South Africa. At the moment service to Johannesburg is operated with chartered Sabena DC-7Cs. Another projected El Al route is to South America.

Operations east of Israel are hampered by the necessity to avoid flying over neighbouring countries. This is a factor militating against the expansion of operations to India and Japan. On the route Teheran, Iran, El Al aircraft have to fly virtually three sides of a square in order to skirt hostile territory. The route from Lod to Teheran is west to Cyprus and north to Ankara, Turkey, before heading east to Iran.

With the delivery of all its five Boeings by early next year the airline will probably reduce its Britannia fleet from four to two aircraft. The last two aircraft of the Constellation fleet which was the mainstay of the airline through most of the last decade will be retired this fall.

El Al now is a self-sufficient airline. All airframe overhaul and maintenance work is done at the carrier's base at Lod, whereas Israel Aircraft Industries take care of El Al's engine overhauls. Initially, the airline leased its Bristol Proteus engines from the British manufacturer but this proved to be an expensive business. As soon as possible engines were bought and overhauled in Israel.

The present overhaul life of the Proteus is 1700 hours. Initially, the Conways of the Boeing 707 fleet will go back to Rolls-Royce for overhaul but Israel Aircraft Industries is equipping to overhaul this engine also.

Turbine equipment has brought a profit although initial operations with the Britannia were expensive. The Britannia 300 had not been operated by any other airline and El Al

had to do more than its share of "debugging" the aircraft. The net effect was El Al's fiscal 1958-59 loss of \$1,870,000.

With the Britannias bedded down the carrier showed a profit—\$33,000. In 1960-61 the profit was \$275,000. This year costs are high due to introduction of the Boeing fleet but company officials expect a small profit, maybe \$10,000.

Although El Al is virtually a government-owned company (the 7% non-governmental share holding is in the hands of public institutions) it pays full taxes. Officials have complained about the Israeli government's recent decision to increase landing and parking fees.

Turnover 200% by 1965

Few industries in Israel have such a high turnover compared with capital investment as El Al. In fiscal 1956-57 turnover was 90.7% of investment. In 1960-61 it was 131.5% and in 1965-66 it is expected to amount to 200%.

Turnover has risen steadily over the past few years, increasing from \$8,200,000 in 1956-57 to \$26,950,000 in 1960-61. Projected turnover for 1965-66 is \$46,700,000.

In terms of costs El Al has been steadily improving. In 1956-57 the cost of producing a ton-mile was 59 cents. This was reduced to 53 cents in 1959-60 and 49 cents in 1960-61. On the other hand, income from each ton-mile diminished from 63 cents in 1956-57 to 53 cents at present.

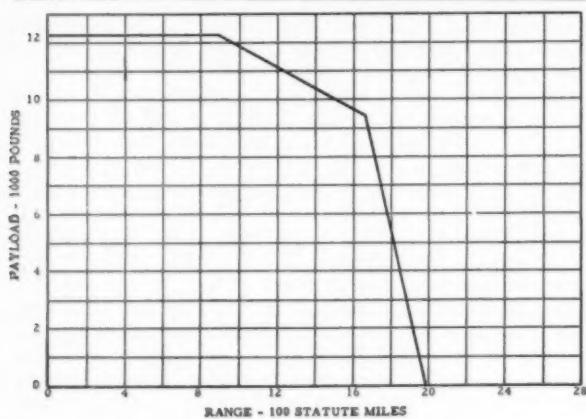
El Al derives most of its revenue from third and fourth freedom traffic. In 1960 it carried 112,100 passengers and of those 100,000 travelled to or from Israel. Nonetheless, El Al enjoys fairly liberal fifth freedom rights in the European countries through which it flies. France and the United Kingdom each allow El Al fifth freedom rights on three transatlantic flights weekly from Paris and London.

While the future of El Al is obviously linked with the future of Israel, it is clear that the airline has now reached the "big league" stage. For a company whose name means "to the sky" the sky is the limit. ■

Cargo F-27

Brightens Outlook

At Fairchild



PAYOUT/RANGE CURVE for the "G" reveals maximum payload capability of 12,383 lbs. out to 900 miles but equipment options could raise it to 13,000 lbs.

BIG FRONT DOOR identifies Fairchild F27G being offered as a modern logistics vehicle to replace older piston types such as C-46 on domestic Logair routes.



A FOUR-PHASE PROGRAM now being pursued by the new management of Fairchild Stratos Corp. is pumping new life into the sales future of the company's F-27 twin turboprop.

Confident of at least partial success, Fairchild has resumed limited production of F-27s with a one-a-month output from September through December of this year tapering off to about four in the first half of 1962.

The program is aimed at improving the F-27's position in executive aircraft markets, exploring cargo potential, improved performance through aerodynamic clean-up and, finally, a longer-range plan involving bigger turbines.

First project involves an improved F-27F which will increase its gross takeoff weight to 39,400 lbs., raise the fuel capacity to 1920 gals., and increase cabin pressurization to provide an 8000 ft. cabin up to 25,000 ft. FAA certification of this model gets underway this summer with completion expected in time for first delivery in September.

Also starting this summer is a fuselage drag clean-up project which will increase cruise speed from 300 to 315 mph. This entails redesign of the two aft air conditioning inlets into a single scoop at the base of the vertical fin.

Fairchild's No. 3 project, but the one with the most potential if it hits pay dirt, is the F-27G, a 42,000-lb. cargo adaptation of the "F" available in 12 months.

Major changes would involve the addition of a 91.5 by 70 in. forward cargo door, installation of a heavy (200 lb./sq. ft.) floor and the use of a fuel dump system.

Fairchild is proposing the "G" as an FAA-certified off-the-shelf model for a number of government agency airlift requirements including MATS C-46 Logair services. A "swing tail" version of the "G" would be available if the military insists upon straight-in loading for shorthaul Logair operations. Certification of the "G" is expected by next spring.

Last of Fairchild's four projects involves possible adaptation of the F-27 to new engines such as General Electric's T64 or Lycoming's T55. Although this phase is probably still a year away, it could be accelerated by military interest in gaining service experience on the T64.

The GE turboprop was virtually a unanimous choice of airframe bidders in the Defense Department's recent tri-service V/STOL competition and a fleet installation in F-27s for military Logair services presents an attractive means of building up experience with the engine well in advance of wide-scale V/STOL operations. To date, the only planned installation of the T64 is a single-plane conversion of a deHavilland-Canada Caribou.

Whether any or all of Fairchild's F-27 plans are successful remains to be seen, but at least the prospects are brightening. Although the company sold its last F-27 to Bonanza Air Lines recently, it reportedly lost out on two other sales for want of an airplane to deliver. It isn't easy to sell airplanes that aren't being built, Fairchild has found, and the resumption of production will erase that obstacle. ■

Specs on the F-27G

Max T/O gross weight	42,000 lbs.
Operating weight empty	23,917
Fuel weight (136 gals.)	8,684
Max. cargo load	12,383
Design landing gross	37,500
Zero fuel weight	36,300

Cargo Compartment

Length	57.5 ft.
Clear floor width	82 in.
Max. floor width	100 in.
Height at centerline	80 in.
Overall volume	1800 cu. ft.
Floor area	270 sq. ft.
Floor loading	200 lbs./sq. ft.



LAST MINUTE PASSENGER hurries to board 95-seat Lockheed 1049C Super Constellation used by EAL in the shuttle operation. Inscription on plane reads "Fly Eastern Air Bus."

Streamlined Terminal For Air Shuttle

An Eastern Air Lines' passenger made front-page news recently as the only customer on board a 95-seat shuttle flight from New York to Washington. Actually, he was the 96th to sign a machine-generated boarding pass before the scheduled departure of an Eastern shuttle from its new \$500,000 "supermarket" terminal at LaGuardia Field's Hangar No. 8.

This guaranteed "no oversale" is just one feature of a no-frill service which at last reports is exceeding a load factor of 50%. Terminal operations, pictured here, speed the passenger to his flight with costs (and red tape) at rock-bottom minimums.

The EAL shuttle is the biggest step yet to be taken toward low-cost commuter air operations. Among its features: (1) No reservations; (2) Standby aircraft for each flight (no oversales); (3) No tickets; (4) No pre-departure check-in time limits; (5) No baggage checks; (6) Special flight info phone numbers to report operating status, weather, etc. and (7) Special low-rate parking (at New York) for commuters at 25¢ an hour, 75¢ for 12 hrs., only \$1.50 for 24 hrs. ■



PASSENGER SIGNS boarding pass at gate. Scale at center registers excess baggage for which he will pay on board aircraft.



SUPERMARKET ATMOSPHERE of air shuttle terminal at New York's LaGuardia Field is evidenced by line-up (left) of food carts to assist passengers with baggage and small children.

BIG WINDOWS on field side of terminal give friends and relatives an opportunity to view arriving or departing shuttle flights.



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The Caravelle, acclaimed as the quietest jet of all, has won the affection of travelers throughout the world. United Air Lines is happy to introduce this sleek jet to the U.S.A. as the newest member of the world's largest jet fleet. □ Service will start July 14, between Chicago and New York. Other cities will soon be added. □ The captivating Caravelle...another reason to ticket your passengers on United Air Lines. United serves 117 cities coast to coast, border to border and in Hawaii. Most important, United treats your passengers the way you'd want...with *Extra Care*.



WORLD'S LARGEST JET FLEET-KNOWN FOR EXTRA CARE



TECHNICALLY SPEAKING

By Joe Murphy

Silent support for Lord Brabazon . . . All-weather Caravelles . . . Light bulbs that last

Support for Brabazon—They aren't making any public statements, but there's more than one big U.S. airline in solid support of Britain's Lord Brabazon in his views on kerosene versus JP-4. The record is fast strengthening the case, too.

Low fatalities, or total absence of them, in the AA Electra somersault at LaGuardia, Aeronaves over-run at Idlewild and now United's DC-8 at Denver are making the case for kerosene irrefutable. Only 20 fatalities instead of a more likely 289 if the three aircraft had been fueled with JP-4!

Some U.S. airlines don't permit use of JP-4 even under situations of extreme passenger inconvenience such as off-route landings at points where kerosene is not available.

A for effort—Credit Air France and Lear, Inc. for doing something about all-weather operations. The carrier's management has decided to actively pursue a program which will permit Caravelle operations this winter at ceilings down to 50 ft.

Quiet change at FAA—Omer Wellings, with whom every airline engineering and maintenance head has clashed head-on at one time or another, is no longer FAA's chief of maintenance. He's now an assistant to George Prill,

the director of flight services, on a special data processing project.

Fuel notes—As if airline maintenance people don't already have their hands full coping with new jets, now kerosene fuels are making biologists out of them. The new problem: microbial slime—a corrosion creating bacteria involving a wide variety of algae, protozoa, bacteria and fungi which live and multiply on the interface between fuel and water in storage tanks. A recent American Airlines maintenance letter does an outstanding job of describing the new fuel system wildlife. Lockheed gets the nod for one terrific piece of research on the topic.

We heard a good name for the problem: jet athlete's foot.

Suppliers invited—Air Transport Assn.'s subcommittees on ground equipment and maintenance facilities are permitting suppliers to sit in on their meetings as "observers." This means they can listen, but not talk.

If the experiment works out OK, they'll probably be invited to future sessions. Meeting is set for Marriott Key Bridge Hotel, Washington, D.C., September 27-28.

New aircraft, new seats—Century Universal, Inc., Tulsa firm which re-

ports promising results in marketing the Euphorian passenger seat to corporate fleet operators, is proposing a 62-seat Euphorian layout for the BAC-111 small jet. The 28 1st-class seats would be 19-in. wide with 36-in. pitch and 20-in. aisle width. Thirty-four tourist seats would be on 34-in. pitch and have 20.5 in. aisle.

Blast fences—Pilots are looking for changes in end-of-the-runway blast fences—either cutting their height from 10 ft. down to about six, or preferably finding a retractable type fence which would be erected only when needed.

They also would like to see a more frangible construction in event of an overrun. Subject has been alive since the Aeronaves DC-8 hit the blast fence like a stone wall when attempting to abort a takeoff at Idlewild.

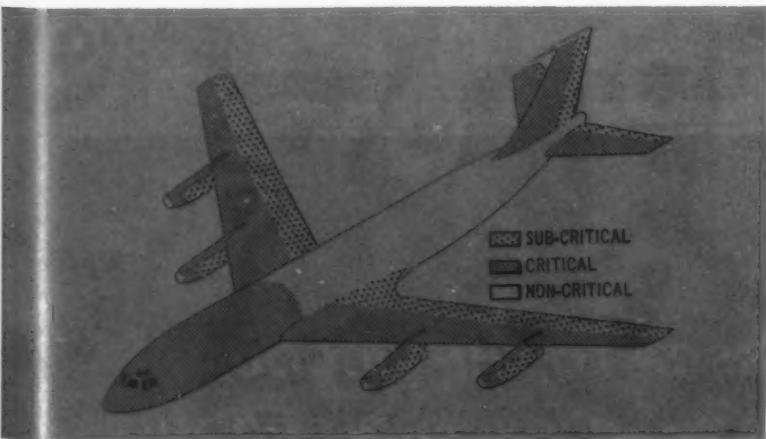
Lead in the nose—Interesting final touch to American Airlines' program to get full utility from aft belly compartment of fan-powered 707s is the addition of 1600 lbs. of lead just aft of the nosewheel well.

Addition of wing leading edge fairing altered the center of pressure of AA's 120s moving CG forward and cut the aft belly load to 3000 lbs. Addition of stabilizer area restored about 2800 lbs. but still left AA using only 5800 of a potential 10,000 lbs. The 1600 lbs. of lead permit another 4000 lbs. bringing the total only 200 lbs. shy of maximum.

The situation doesn't apply to all 707s, but affects those using baggage expeditor arrangements.

Interest in safety—Aerotherm has purchased a copy of the CBS film on the Boston Electra accident for use in its investigations of improved crash safety for cabin seats. The company developed the energy-absorption concept of seat mounting which airline engineers are beginning to recognize as a significant advance in seat safety.

Rugged light bulbs—TWA soon will begin testing a batch of "ruggedized" aircraft light bulbs developed by GE on an experimental basis with the aim of reaching 1000-hr. life. TWA hopes to have finished its evaluation in three to five months.



KEEP IT CLEAN! Boeing has come up with this interesting sketch of the important areas on a jet which airlines should maintain free of dents, seal leaks and the like for best performance. Critical areas should get mandatory attention, the sub-critical are in the desirable class. An "unclean" jet could consume 1.5 lbs. additional kerosene per nautical mile, says Boeing, or two tons of extra fuel for a 2500 mile flight.

BRITISH UNITED THE SHORT HAUL JET



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ONE-ELEVEN**

TWO ROLLS-ROYCE SPEY TURBOFAN ENGINES

**JET SUCCESSOR TO THE VISCOUNT
WITH EVEN BETTER THAN VISCOUNT ECONOMICS**

AIRWAYS CHOOSES

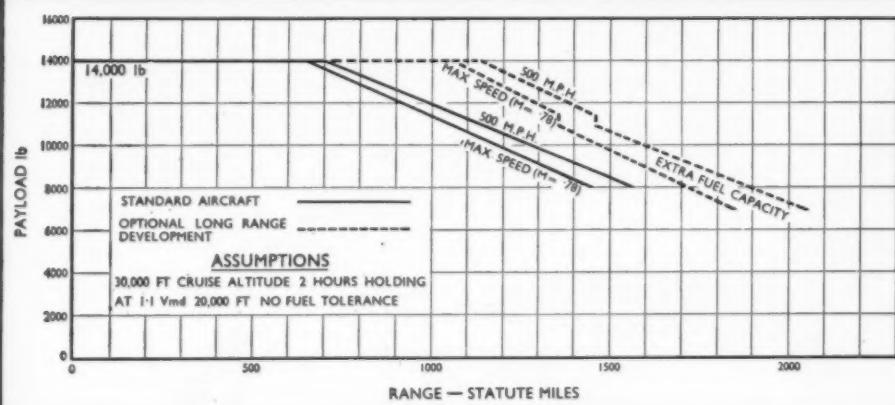
- 540 m.p.h. cruise speed
- 57 mixed class or 69 tourist passengers
- Short airfield performance
- Quick turn-round: built-in auxiliary power unit
- Cabin width for spacious five-abreast seating
- Range of over 1,100 miles with full 14,000 lb payload

BRITISH UNITED AIRWAYS HAS CHOSEN THE OPTIONAL LONG RANGE DEVELOPMENT OF THE STANDARD AIRCRAFT

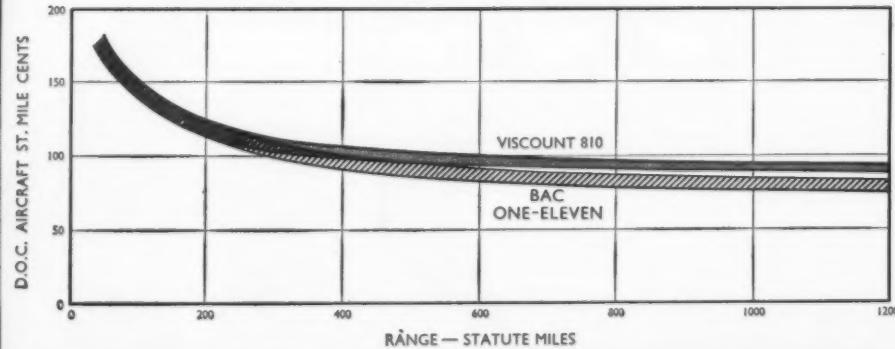
The BAC One-Eleven can carry its full complement of 57 mixed class passengers and baggage at 500 mph for stages of 1,070 statute miles with two hours reserves.

It can carry 43 passengers for 1,500 miles

PAYOUT v. RANGE



ECONOMICS

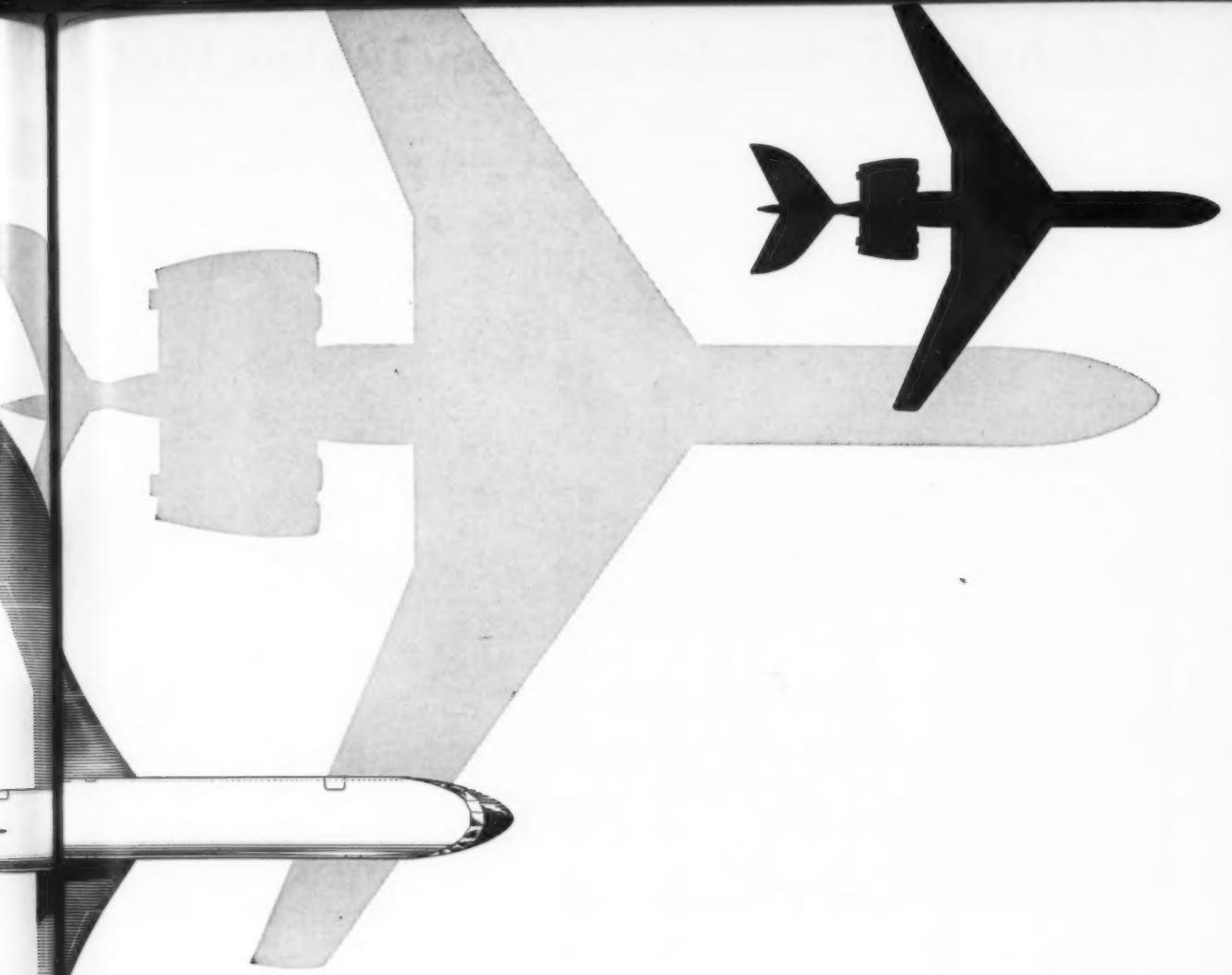


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VC10 and *Super***VC10**

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TGA SVC 18

U.S. Airline Traffic—January/May 1961 vs. 1960

This complete summary compiled by AIRLIFT Magazine from official CAB data

1961 to Date

Month of May

	Revenue Passenger Miles (000)		Revenue Passengers (000)		Revenue Passenger Miles (000)		Revenue Passengers (000)			
	1961	% Change	1961	% Change	1961	1960	% Change	1961	1960	% Change
DOMESTIC										
United	2,344,742	25.2	3,285	17.9	501,963	449,862	11.6	696	655	6.3
*American	2,248,244	-8.3	2,913	-11.8	497,292	531,949	-6.5	657	718	-10.5
*Eastern	1,668,503	-10.3	3,095	-9.2	320,267	340,078	-5.8	657	668	-1.6
*Trans World	1,556,213	-9.8	1,788	-11.1	350,687	373,836	-6.2	399	440	-9.3
Delta	918,313	20.6	1,566	14.6	173,097	154,166	12.3	311	290	7.2
Capital	600,444	-3.3	1,373	-6.5	114,314	129,947	-12.0	279	319	-12.5
Braniif	424,243	-0.3	920	-0.2	88,670	93,615	-5.3	192	198	-3.0
*National	401,221	-18.7	429	-12.3	45,991	74,704	-37.1	85	124	-32.5
Continental	356,004	4.4	541	3.0	71,014	73,049	-2.8	111	113	-1.8
Northeast	334,575	33.9	691	25.0	61,874	43,255	44.3	143	118	21.2
*Northwest	269,611	-52.2	378	-50.5	95,604	107,464	-11.0	141	157	-10.2
*Western	254,459	-34.1	436	-37.9	61,479	69,357	-11.4	108	130	-16.9
Total	11,396,652	-3.2	17,615	-4.9	2,383,252	2,441,302	-2.4	3,779	3,932	-3.9
NOTE: Commencing June 1, Capital statistics will be integrated with United's.										
INTERNATIONAL										
*Pan American Sys.	2,035,143	10.5	1,199	3.1	499,529	406,704	22.8	283	254	11.4
Latin American	526,814	-10.1	424	-14.3	112,471	103,886	8.3	83	84	-1.2
Atlantic	748,204	10.8	568	16.9	211,947	175,519	15.4	154	129	19.4
Pacific	738,637	32.5	187	16.8	169,554	120,602	40.6	41	35	17.1
Alaska	21,508	-4.3	20	-9.1	5,557	6,677	-17.0	5	6	-16.7
*Eastern Overseas	320,224	19.6	210	14.8	54,000	59,976	-9.9	37	42	-11.9
San Juan	251,755	12.7	165	13.0	40,466	50,514	-20.0	27	33	-18.2
Bermuda	10,551	-11.8	12	-25.0	3,528	3,729	-5.4	4	5	-20.0
Mexico	57,918	78.9	33	57.1	10,006	5,733	74.5	6	4	50.0
*Trans World	267,119	-21.9	94	-20.3	78,345	114,208	-31.4	26	40	-35.0
United	144,960	28.7	58	28.9	29,512	30,074	-1.9	12	12	...
*Northwest	108,855	-18.8	55	-26.7	31,100	28,953	7.4	16	16	...
Panagra	86,109	11.3	49	-5.8	16,275	14,375	13.9	9	10	-10.0
Trans Caribbean	68,884	-2.2	45	-2.2	14,306	18,175	-21.2	9	12	-25.0
Braniif	54,807	28.9	37	60.9	11,738	10,520	11.6	7	5	40.0
*American	36,840	-30.9	34	-33.3	5,453	7,927	-31.2	5	8	-37.5
*Western	21,227	-43.2	14	-44.0	5,709	7,122	-19.8	4	5	-20.0
Caribair	12,872	9.9	182	9.0	2,232	2,165	3.1	33	32	3.1
Mackey	10,201	-8.5	60	-3.2	1,537	1,631	5.8	10	10	...
Delta	8,671	-48.7	5	-58.3	1,711	3,629	-52.9	1	2	-50.0
*National	865	-91.4	2	-84.6	.....	1,545	.....	.....	2	...
Total	3,178,799	4.9	2,044	0.4	751,547	707,004	6.3	452	450	0.4
LOCAL SERVICE										
North Central	71,982	10.1	395	5.6	15,002	14,182	5.8	83	81	2.5
Allegheny	62,600	48.4	301	33.0	15,113	11,586	30.4	73	59	23.7
Mohawk	56,203	40.4	278	36.7	12,976	10,225	26.9	63	52	21.2
Pacific	44,421	-2.3	188	-5.1	9,758	10,131	-3.7	41	44	-4.7
Ozark	40,739	6.5	227	4.6	8,946	9,139	-2.1	52	52	...
Frontier	39,071	14.3	144	9.9	7,396	7,311	1.2	29	28	3.6
Piedmont	38,483	6.8	181	5.8	9,661	8,919	8.3	45	42	7.1
West Coast	37,745	1.7	151	-4.4	7,523	7,996	-5.9	31	34	-8.8
Bonanza	32,288	18.2	127	15.5	4,405	5,171	-23.9	26	21	23.8
Trans Texas	29,218	1.1	126	1.6	4,236	6,745	-7.5	27	29	-6.9
Southern	27,397	22.3	150	21.0	4,085	5,600	8.7	33	31	6.5
Lake Central	22,269	51.1	140	48.9	4,261	3,439	82.1	38	21	80.9
Central	15,610	22.1	79	19.7	3,584	2,912	23.1	19	15	26.7
Total	518,026	16.5	2,487	13.3	114,946	103,356	11.2	560	509	10.0
HELICOPTERS										
Chicago	1,725	-20.8	103	-16.3	388	501	-22.6	22	30	-26.7
New York	1,189	4.3	56	...	223	247	-16.5	12	13	-7.7
Los Angeles	629	16.9	18	38.4	141	124	13.7	4	4	...
Total	3,543	-5.8	177	-7.8	752	892	-15.7	38	47	-19.1
INTRA HAWAII										
Hawaiian	26,289	-35.7	166	-15.7	5,107	8,842	-42.2	34	40	-15.9
Aloha	18,645	-6.5	127	-2.3	3,622	4,032	-10.2	25	28	-10.7
Total	44,934	-26.1	293	-11.6	8,729	12,874	-32.2	59	68	-13.2
ALASKA										
Pacific Northern	42,064	17.1	45	15.4	10,711	11,134	-3.8	12	11	9.1
Alaska	40,206	-4.3	42	-14.3	9,275	8,690	6.7	10	11	-4.1
Reeve	5,446	-6.2	6	-14.3	1,429	1,611	-11.3	2	2	...
Northern Consol.	3,063	4.3	9	-10.0	1,094	842	29.9	3	3	...
Wien	3,032	10.7	12	...	1,109	1,244	-10.9	4	4	...
Alaska Coastal	2,039	1.4	20	5.3	593	597	-0.7	6	6	...
Cordova	1,283	-6.6	7	...	330	306	7.8	2	2	...
Ellis	847	10.5	14	-6.7	NA	NA	...	NA	NA	...
Total	97,980	4.8	155	1.9	24,541	24,424	0.5	39	39	...
ALL CARGO										
	1961	1960	% Change	1961	1960	% Change	1961	1960	% Change	...
Axico	5,931,999	6,275,595	-5.5	5,983,862	6,378,919	-6.2	11,654,027	7,779,871	49.8	
Flying Tiger	NA	NA	...	NA	...	...	NA	...	...
Riddle	NA	NA	...	NA	...	...	2,551,521	7,227,370	-64.7	
Slick (C)	169,351	429,819	-60.6	169,351	429,819	-60.6	254,485	472,340	-46.1	
Aerovias Sud	3,379,044	1,963,823	72.1	4,479,923	2,381,810	88.1	6,095,491	4,494,479	35.6	
Seaboard World	9,400,414	8,669,237	9.4	10,633,136	9,190,548	15.7	20,557,524	26,519,618	-22.5	

NA—Not available account carrier delinquent in reporting to CAB.

*Designates operations affected by labor shutdown since Jan. 1, 1961.



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Continental's 707 Ranks As Lowest Cost Jet

The Boeing 707 in operation by Continental Air Lines led U.S. domestic airlines in the low cost column during the first three months of 1961 with a total aircraft operating expense of 162.9¢ per revenue mile.

Aided by a utilization of 11.02 hrs. per day, also tops for the industry, CAL came up with a seat-mile cost of 1.43¢ and passenger-mile cost of 2.87¢.

Ranking second and third to Continental, both with much larger fleets, were American's 707s and United's DC-8s. AA's direct cost was 180¢ and United's 194¢.

With an overall cost pattern which is generally lower than the corresponding three months in 1960, here's how the carriers fared by type of equipment:

Douglas DC-8—Costs varied from a high of 227.4¢ per revenue mile at Northwest (still in labor walk-out at the time) to a low of 194.0¢ for United. Comparative 1960 range was 269.3¢ down to 228.0¢. Utilization varied from United's 8:17 hrs. to 6:17 for NWA. Other operators were in the 7-to-8 hr. bracket.

Convair 880—Low for the industry was Delta's 199.8¢

per revenue plane-mile as both TWA and NEA were still in the early stages of operation. Northeast 6:19 hrs. utilization led the three carriers.

Boeing 707—From Continental's low of 162.7¢, costs ranged up to 228.9¢ for TWA although Western's leased 707s showed costs of 343.1¢ per revenue mile.

Boeing 720—American's 191.0¢ and United 242.0¢ were both experienced during a period of fleet build-up. Capital's leased 720 operation ran 235.5¢ per revenue plane-mile. ■

FIRST QUARTER 1961 JET OPERATING COSTS AND STATISTICS

Costs in cents per revenue mile

DOUGLAS DC-8

	DAL	EAL	NAL	NWA	UAL	TWA	NEA	DAL	NEA	AA	707	707 FAN	AA	707	BNA	CAL	707	TWA	707-231	UAL	WAL	707	
Crew Salaries and Expenses	26.84	32.89	22.29	24.39	31.49	28.46	21.3	57.51	55.4	37.94	N.A.	29.24	27.54	22.46	32.74	32.24	33.76	31.34	30.5	42.2	31.34	30.5	
Fuel, Oil and Taxes	50.57	57.17	41.41	55.11	57.7	57.7	45.0	19.1	16.0	22.6	N.A.	52.7	57.7	51.9	52.6	54.5	54.5	50.5	50.5	52.6	52.6	50.5	
Insurance	17.2	19.3	21.3	25.1	1.4	1.4	1.4	1.4	1.4	1.4	N.A.	12.3	24.1	26.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	
Other	...	...	...	...	...	...	...	...	...	...	N.A.	...	...	...	...	...	...	...	...	...	...	...
Total Flying Operations	103.0	109.2	101.6	12.28	94.7	98.2	86.0	114.4	N.A.	93.7	98.4	104.2	93.8	97.7	100.1	104.9	102.1	102.1	102.1	102.1	102.1	102.1	
Labor	13.3	15.5	8.1	17.7	12.6	16.2	12.3	14.3	14.3	12.9	N.A.	12.9	11.9	8.8	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	
Materials and Outside Repair	29.3	26.2	31.1	27.9	18.9	18.2	16.2	5.2	22.4	22.4	N.A.	18.4	15.3	22.2	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	
Reserves	(1.7)	...	...	...	...	...	...	...	...	...	N.A.	...	...	5.4	...	...	...	...	...	...	...	...
Total Direct Maintenance	38.9	41.7	42.8	31.6	31.3	31.3	31.3	48.9	72.6	N.A.	31.3	27.4	46.2	3	34.7	41.2	39.5	42.7	44.4	42.7	44.4		
Maintenance—Indirect	27.4	14.1	16.7	9.8	26.1	27.4	27.4	27.4	27.4	27.4	N.A.	20.4	27.1	10.5	4	13.1	20.1	25.1	28.3	14.3	28.3	14.3	
Total Maintenance	64.3	85.3	84.9	81.4	81.4	81.4	81.4	73.3	73.3	73.3	N.A.	60.7	54.5	86.7	7	7	7	7	7	7	7	7	
Depreciation—Aircraft	77.1	52.3	52.3	52.1	27.8	22.8	22.8	35.7	35.7	35.7	N.A.	18.9	17.4	32.7	27	17.5	36.3	36.4	31.2	31.2	31.2	31.2	
Buildings and Other	17.1	10.3	17.4	11.2	9.3	10.4	10.4	16.9	16.9	16.9	N.A.	2.9	2.9	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Total Depreciation	84.2	14.7	52.0	52.0	41.3	27.2	27.2	33	33	33	N.A.	3.3	3.3	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	
Aircraft and Engine Repairs	...	...	...	...	...	...	...	2.9	35.0	35.0	N.A.	...	18.8	...	18.7	...	18.7	...	18.7	...	18.7	...
Total Aircraft Operating Exp.	225.54	221.44	211.34	227.49	194.46	197.46	201.46	208.84	208.84	208.84	N.A.	180.84	191.04	201.84	205.54	162.54	228.19	224.34	202.44	230.19	230.19	230.19	
Horn Flows—Revenue	3,710	6,021	2,368	781	18,775	4,627	3,079	3,058	234	15,294	117,222	7,323,479	1,460,049	1,459,976	1,444,726	4,247,206	4,200,749	1,400,875	3,231,174	305,304	305,304	305,304	
Training	140	71	10	16	202	52	40	47	38	417	4,517	2,741	2,741	2,741	2,741	2,741	2,741	2,741	2,741	2,741	2,741	2,741	
Other	10	10	10	10	10	10	10	10	10	10	N.A.	10	10	10	10	10	10	10	10	10	10	10	
Total Hours Flown	3,649	6,180	2,370	778	20,163	6,089	3,411	3,798	293	15,816	6,467	1,768	1,768	1,768	1,768	4,734	9,861	3,829	9,826	237	237	237	
Revenue	7.59	7.59	7.18	7.16	8.17	8.17	8.17	8.17	8.17	8.17	N.A.	4.98	8.62	7.53	6.92	8.51	11.52	7.92	7.21	8.58	4.94	8.58	4.94
Average Fleet Size	5.8	9.1	3.0	1.3	5.3	5.3	5.3	5.3	5.3	5.3	N.A.	4.7	11.7	9.3	3.0	1.8	5.5	13.9	5.5	13.9	5.5	13.9	5.5
Average Aircraft Miles	1,615,625	2,716,541	1,105,795	385,240	8,097,264	2,099,162	1,240,728	1,180,049	117,222	7,323,479	3,093,276	768,305	56,757	56,757	56,757	48,757	48,757	48,757	48,757	48,757	48,757	48,757	48,757
Passenger Load Factor—1st Class	77.2%	77.2%	73.3%	71.4%	51.7%	55.7%	48.7%	48.7%	48.7%	48.7%	N.A.	74.0%	74.0%	74.0%	74.0%	74.0%	74.0%	74.0%	74.0%	74.0%	74.0%	74.0%	74.0%
Passenger Load Factor—Coach	63.1%	63.1%	63.1%	63.1%	57.4%	57.4%	57.4%	57.4%	57.4%	57.4%	N.A.	64.7%	64.7%	64.7%	64.7%	64.7%	64.7%	64.7%	64.7%	64.7%	64.7%	64.7%	64.7%
Average Seats Per Mile	117.3	120.9	124.3	124.3	120.9	120.9	120.9	120.9	120.9	120.9	N.A.	112.9	81.2	81.2	81.2	102.5	102.5	102.5	102.5	102.5	102.5	102.5	102.5
Cost Per Seat Mile	1.72	1.83	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	N.A.	1.72	2.46	2.46	2.46	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
Cost Per Passenger Miles	2.47	2.47	2.47	2.47	2.47	2.47	2.47	2.47	2.47	2.47	N.A.	1.04	1.04	1.04	1.04	2,254	2,254	2,254	2,254	2,254	2,254	2,254	2,254
Average Flight Length—Miles	872	920	1,036	1,036	1,036	1,036	1,036	1,036	1,036	1,036	N.A.	882	882	882	882	1,254	1,254	1,254	1,254	1,254	1,254	1,254	1,254
Average Speed—Albion—M.P.H.	429	457	457	457	457	457	457	457	457	457	N.A.	457	500	500	500	500	500	500	500	500	500	500	500
Average Range—Block—Miles	381	404	404	404	404	404	404	404	404	404	N.A.	399	399	399	399	444	444	444	444	444	444	444	444
On Consumption—Gallons per hour	2,121	2,121	2,121	2,121	2,121	2,121	2,121	2,121	2,121	2,121	N.A.	2,121	2,121	2,121	2,121	2,121	2,121	2,121	2,121	2,121	2,121	2,121	2,121

Flectra Speed-up Promises Cost

Operators of the Lockheed Electra turboprop will soon be turning back the clock to a pattern of operating costs they haven't seen since late 1959 and the early weeks of 1960. And with the return of the turboprop to its unrestricted operating speed, the first quarter of 1961 should prove the end of the "high-cost era" in Electra operations.

For example, between January and March, revenue plane-mile costs ranged from a low of 194.1¢ for National to a high of 259.2¢ for American, excluding

Northwest's operation which was influenced by a labor shutdown. The year previous, with some minor influence from the first few weeks of the speed reduction, Electra costs varied from a low of 107.4¢ for Northwest to a high of 168.7¢ for American.

In Vickers Viscount operations, Continental was the low-cost operator at 108.2¢ per revenue plane-mile. Capital recorded 112.9¢ and Northeast 134.3¢, all up slightly from the same period in 1960. Capital's utilization of 8:39 hrs. was tops for the group. ■

Relief Soon

Allegheny's Convair 540 showed direct costs of 142.5¢ per revenue plane-mile to produce seat-mile costs of 2.74¢ for the period.

Among other local airlines, the Fairchild F-27 showed costs varying from a high of 122.8¢ for Piedmont to 94.1¢ for Bonanza. Bonanza's F-27 also showed the fastest average airborne speed, 213 mph over a 130-mile average segment. Stage distances for other F-27 operators were much lower, ranging from 85 miles for Piedmont to 122 miles for Pacific. ■

FIRST QUARTER 1961 TURBOPROP OPERATING COSTS AND STATISTICS

Costs in cents per revenue mile

	LOCKHEED ELECTRA				VISCOUNT				CONVAIR 540				FAIRCHILD F-27			
	AA	BAL	NAL	NWA	WAL	CAP	NEA	AAA	BAL	OZA	PAC	PAN	PAJ	WCA		
Crew Salaries and Expenses	41.04	32.04	43.46	31.34	41.70	33.48	26.49	26.46	20.14	23.16	25.75	29.84	25.46	142.54	142.54	
Fuel, Oil and Taxes	27.0	22.7	28.1	26.4	28.0	25.8	22.1	24.3	16.5	16.7	16.7	18.0	18.0	118.46	118.46	
Insurance	7.8	7.2	9.3	12.8	21.1	21.1	3.1	8.1	7.5	7.8	7.1	7.1	7.1	8.3	8.3	
Other	6.8	7.2	... ...	1.5	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...
Total Flying Operations	73.8	67.7	80.8	71.1	91.3	90.3	54.4	49.7	57.4	60.6	65.0	66.0	61.4	54.9	54.9	
Laborers and Outside Repairers	18.8	14.1	19.5	8.7	12.4	5.4	11.3	10.0	15.1	8.8	12.3	12.7	10.7	10.2	10.2	
Reserves	54.6	43.6	28.3	32.9	63.3	61.0	10.7	13.2	11.3	16.7	29.3	21.1	21.1	19.7	19.7	
Total Direct Maintenance	73.4	61.5	67.0	47.1	45.7	42.5	19.3	28.8	31.0	41.4	30.0	40.9	36.3	42.0	42.0	
Maintenance—Indirect	62.9	17.4	17.8	16.0	33.7	13.0	17.0	11.6	18.3	19.2	7.3	13.8	14.4	11.8	11.8	
Total Maintenance	116.2	98.9	66.6	43.1	97.4	75.5	36.3	40.4	49.3	60.6	37.7	54.7	50.7	52.4	52.4	
Depreciation—Aircraft	35.4	31.7	32.8	43.2	54.0	43.7	15.2	16.9	14.0	11.7	6.4	7.8	12.3	8.4	8.4	
Engines	8.5	12.8	11.2	14.5	11.2	14.5	3.2	3.9	6.8	5.4	2.5	2.7	2.4	6.1	6.1	
Part & Other	6.5	7.8	16.8	5.6	22.3	8.8	3.7	3.2	5.0	4.0	2.5	3.4	3.3	1.9	1.9	
Total Depreciation	40.1	40.0	63.4	40.0	92.8	52.7	22.1	18.1	27.9	21.3	11.4	13.1	19.9	14.3	14.3	
Aircraft and Engine Rentals	27.1	... ...	...	...	...	...	6.8	...	...	...	...	...	...	...	...
Total Aircraft Operating Expenses	259.26	214.54	209.46	194.16	243.46	233.34	112.34	108.24	134.34	142.54	94.16	113.46	122.46	122.46	122.46	
Hours Flown—Revenue	12,805	2,440	14,279	5,033	1,593	2,311	37,776	9,000	5,770	1,801	4,924	1,736	2,443	4,934	4,934	
Trained	300	55	500	43	43	40	387	387	387	387	4	4	4	4	4	
Other	246	93	444	15	43	87	301	301	301	301	6	6	41	46	47	
Total Hours Flown	13,351	2,707	19,246	5,931	2,003	2,400	38,664	9,120	5,937	1,916	5,002	1,746	2,372	4,110	4,400	
Revenue Utilization	5.35	4.13	5.13	5.03	5.03	5.03	3.42	8.39	8.39	8.39	6.26	4.31	5.26	8.38	8.38	
Average Fleet Size	25.5	7.0	39.0	9.5	12.8	9.5	6.4	4.7	12.7	10.0	4.0	8.0	8.0	6.0	6.0	
Passenger Aircraft Factor—1st Class	53.3%	57.4%	57.4%	57.4%	57.4%	57.4%	51.2%	51.2%	51.2%	51.2%	48.4%	53.3%	53.3%	48.4%	48.4%	
Passenger Load Factor—Coach	42.3%	74.4%	4.6%	1.5%	1.5%	1.5%	45.4%	45.4%	45.4%	45.4%	45.4%	52.0	52.0	40.0	40.0	
Average Seats Per Mile	69.3	44.3	3.124	3.124	3.124	3.124	71.0	40.2	40.2	40.2	40.2	44.0	44.0	36.8	36.8	
Cost Per Seat-Mile	7.000	4.124	7.000	4.124	7.000	4.124	2.624	2.624	2.624	2.624	2.624	2.746	2.746	3.424	3.424	
Passenger Miles	351	289	289	289	289	289	352	352	352	352	4,154	4,154	7,376	7,376	7,376	
Average Flight Length—Mile	7.000	4.124	7.000	4.124	7.000	4.124	2.624	2.624	2.624	2.624	2.624	11.0	11.0	11.5	11.5	
Average Speed—Airborne—M.P.H.	243	258	258	258	258	258	277	277	277	277	277	223	223	200	200	
Fuel Consumed—Gals. Per Hour	463	457	457	457	457	457	223	223	223	223	223	194	194	165	165	
Oil Consumed—Gals. Per Hour	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	

Is Defense Advertising Necessary?

There has been a lot of talk lately about the cost of the advertising done by defense contractors. One prominent Senator recently said he was greatly disturbed over heavy defense advertising expenditures. He pegged the cost "to the taxpayer" at \$500 million.

This figure is many, many times the actual total of defense advertising expenditures and only a fraction of that total is recoverable. The Senator's facts are wrong; but, even more disturbing, it appears that he doesn't understand the purpose and function of sound advertising. He considers this money down the drain and thinks it should not have been spent.

There are other instances demonstrating a growing wave of anti-advertising sentiment in high government places. They indicate a lack of understanding and represent a threat both to freedom of the press and success of the Nation's defense goals.

We publish specialized business magazines and reference books. Several of these are defense oriented. They perform communications functions essential to our national goals . . . more essential now than ever before because of the complexity of today's technological and political challenges. There are other excellent magazines having the same or similar purposes. We're delighted—because competition is healthy and because there is more to be done than can be handled by any one of us.

Virtually all publications are financed, by and large, by advertising. This is healthy, too; but it is not the primary reason for defense advertising.

We believe that advertising is an effective and necessary tool for the defense contractor. The objectives of defense advertising are many: some of them obvious, others more subtle.

Sales is one obvious objective. It can be demonstrated that advertising, for some defense products, has led directly to sales. In other instances, selling is a long, complex process, where features

of current products may not be as important as company reputation. In both cases, the government wants competition for defense contracts—by use of a competitive bidding system, it gets better products for less money. How is a company to compete if it is not allowed the use of sales tools—one of which is advertising?

Recruiting is another obvious objective. Will that engineer who is inspired to contribute to technological advancement in the missile/space age, for example, be interested in learning more about the kind of company he goes to work for? You bet he will, and more power to him.

The dissemination of technical information is a third, and perhaps the most important, objective. The exchange of such information is one of the biggest problems facing both government and industry. And what more effective, more economical means of disseminating necessary technical information exists than the business press? Mills Shepard, who performs readership studies on one of our publications, reports that advertisements are often read as avidly as the editorial pages. And Eastman Research, in a study released May 29, based on more than 100 surveys for 32 business-paper clients over a two-year period, reports that *70% of the readers interviewed read the advertising in these business papers on purpose.*

There are many other equally important objectives. Companies must raise capital in order to be able to do the jobs that need doing for defense. Good community and employee relations are considered necessary to a company's well-being. These and other objectives have been effectively achieved by defense contractors through advertising.

The defense industry is made up of numerous private companies facing the tremendous challenge of meeting, in cooperation with the government, our national technological goals. To meet this challenge, the companies must be strong and healthy. To deprive them of the use of effective and honest advertising is shortsighted and wrong.

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KLM Still Rates Electra Tops

AMSTERDAM—The most popular aircraft in KLM's fleet today is the Lockheed Electra. Officials of the Dutch airline sound like Lockheed public relations men when they discuss the turboprop transport. Says E. H. van der Beugel, President of KLM: "The management of KLM has been extremely satisfied with the performance of the Electra—it delivers the best on-time record in KLM's history, it has proved an able competitor to other aircraft on our routes, and it has been received with extraordinary enthusiasm by passengers, ground crews and flight crews alike."

KLM has had its share of the repercussions from the Electra troubles, although less than have U.S. operators of the Lockheed turboprop transport. The large number of Americans who rate KLM their favorite airline backed away from the Electra after the accidents in the U.S. Although the troubles with the aircraft did not hit the headlines in Europe the way they did in the U.S., many of KLM's passengers were at least vaguely aware that there was something not quite right with the aircraft. Electra load factors dipped although not to the extent that they did in the U.S.

However, as KLM was—and still is—the only European operator of the Electra, it had to bear the full brunt of the hesitation among air travelers to use the aircraft. The Dutch Department of Civil Aviation decided to follow the example of FAA in allowing the Electra to keep flying but with a temporary limitation on maximum speed. The loss of revenue from passengers' reluctance to fly in the Electra and the increased operating expenses caused by the speed restriction cost KLM some \$2 million in 1960.

But the KLM management never doubted the correctness of its decision to buy the Electra. When the Dutch airline was shopping for new equipment for its short and medium-haul routes for introduction in 1959 KLM evaluated all competing types and found no other aircraft was better suited to its short and medium-haul routes. The requirement was for something smaller than the DC-8 and bigger than the Viscount. The Electra seemed as though it was specifically designed for KLM's use. Its speed, range, payload and operational characteristics



KLM ELECTRA (above) is one of twelve originally purchased from Lockheed. In foreground is Fokker F-VIIB.

matched perfectly the use to which KLM planned to put the aircraft.

In practice, the Electra has worked out extremely well. On short hauls it is frequently faster than pure jet aircraft. On medium hauls it is as fast in schedule speed as the Caravelle. Because of its excellent range the Electra can often beat the Caravelle on elapsed journey time.

KLM particularly likes the airport performance of the Electra. Last winter on the Moscow run where bad weather and icy runways frequently prevailed, KLM Electras achieved the best regularity record on the route—competing against twin and four-engine pure jets which had many cancellations and delays.

The on-time performance of the Electra is particularly noteworthy. The airline says that the Electra has delivered the best on-time performance in KLM's 41 years of experience. In the last three months of 1960 the Electra had only 2.5 delays of over one hour per 100 departures. This is more than twice as good as for other aircraft in the KLM fleet.

KLM pilots rate the Electra tops. The cockpit layout evokes particular praise. Ground crews are highly enthusiastic about the Electra's easy maintenance. Maintenance cost this year are 15% less than budgeted. KLM deputy president F. Besancon has been

particularly impressed with the good backup that the airline has received from Lockheed and engine manufacturer Allison.

In the first year of Electra operations only three engines had to be changed between overhaul periods. Premature engine removals on the Super Constellation in the same period totalled 29. Overhaul life of the Allison engine was increased from 1200 to 1400 hours on July 1. The reliability of the Allison engine is such that KLM has only 3 spare engines at points on its route to Singapore.

Each of KLM's Electras (including the one leased to Air Ceylon) fly an average of 6½ hours daily. They are mainly used on routes from Europe to the Middle East and West Africa but also fly on the long route from Amsterdam to Singapore. It is likely that the Electra will take over certain intra-European routes from the Viscount next year.

To date more than 100,000 passengers have flown in the KLM Electra, the most popular aircraft in the Dutch airline's fleet.

The only accident so far experienced was of an operational variety not related to the type of aircraft involved. This occurred on June 12 when a KLM Electra struck a sand dune during a low approach to Cairo.



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carpet comparison tests, including 100 commercial launderings, proved: 1. "Royal" cleans more easily, more uni-

formly than any other carpet Eastern had ever used or tested before. 2. "Royal" does not shrink . . . holds to exact size specifications. 3. "Royal" Caprolan pile maintains its texture and character better . . . is unsurpassed for wear . . . colors remain true. No wonder Eastern now specifies "Royal" of Caprolan for all their new and refurbished passenger planes. This is experience you'd do well to profit by. Contact Collins & Aikman and find out about "Royal"—today!



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Pan Am's New Cockpit Alarm

Pan American is retrofitting its jet fleet with a sophisticated instrument warning system it feels will provide greater safety and hopes will supply one of the required necessary ingredients towards reducing jet landing minimums to 200-½ or lower.

Whatever the motivation for this project, it certainly is timely. It highlights another area of concern to pilots flying transport aircraft—the need for an instrument failure warning system that *really* warns.

Effort had to come

Research and development on warning systems was natural as aircraft got bigger, faster, more heavily instrumented and more complicated. There were two reasons—safety and economy.

In light of industry experience, research in this field must be continued. I'd like to meet the airline pilot who hasn't had at least one false engine fire warning in his career! On the other hand, there were probably an equal number that were the real thing.

Innumerable engines have been saved through the use of engine analyzers. But here again, the record indicates we don't always get the right answer. The failures most alarming to pilots are those which occur to the flight and navigational instruments when flying IFR. Fortunately, the record is good. But just one failure at the wrong time could be disastrous.

When I say the record is good I refer to the fact that relatively few fatal accidents can be positively, di-

rectly, and solely attributed to this type of malfunction. However—and this should be emphasized—instrument malfunctions occur more frequently than most non-aviation people realize. But those of us flying are able to cope with most of them and have learned to live with them.

Sticking state of the art

A good number of these are unexplainable even to the experts who charge them off to the state of the art; for example, stricking altimeters, "hanging-up" course indicators, "locked" horizons, erroneous radio navigation signals, etc.

Dual instrumentation, warning systems, and constant cross-checking has kept most of us out of trouble. How-



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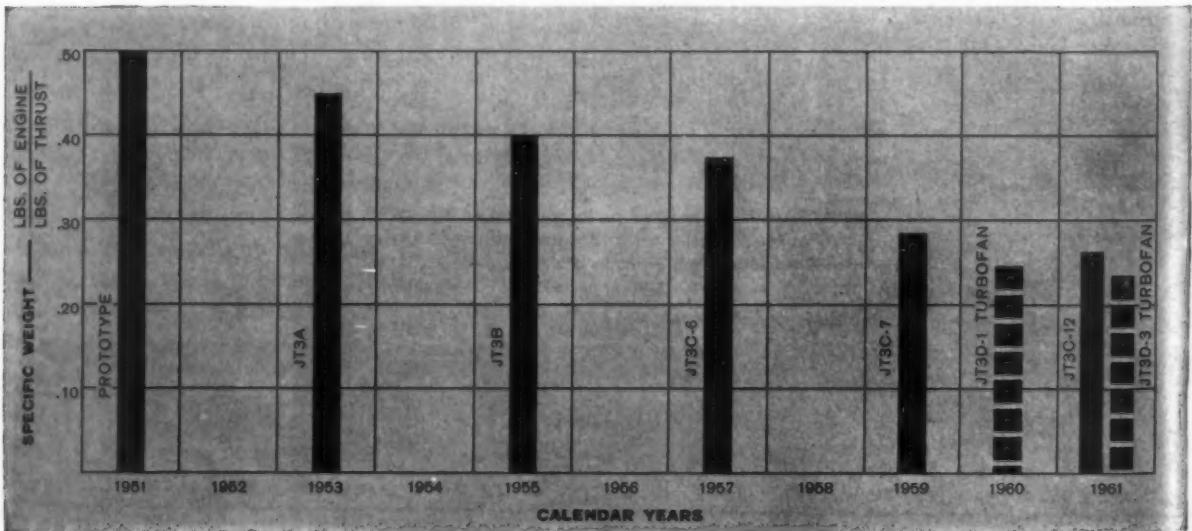
pares down specific weight

Each new generation of Pratt & Whitney Aircraft jet engines has shown a substantial reduction in specific weight. (See chart below.) By far the most dramatic improvement, however, has been achieved in the specific weight of the JT3D-3 turbofan—22 to 26 per cent less than advanced conventional jets. In addition, the turbofan uses approximately 15 per cent less fuel at comparable cruise thrust. These improvements make possible lower operating costs, increased payloads, and more than 20 per cent greater range. **PRATT & WHITNEY AIRCRAFT**

Division of UNITED AIRCRAFT CORPORATION
East Hartford, Connecticut



SPECIFIC WEIGHT IMPROVEMENT IN PRATT & WHITNEY AIRCRAFT JT3 FAMILY



ever, the tolerances are so tight now and the margins so thin that unless immediate recognition of instrument malfunction occurs—for example, when close to the bottom of a 200-½ approach—a flight could be in serious trouble.

Flag type warnings presented in different ways are accepted and in use by most carriers. Ignoring for the moment those times when the flag warning fails to work, another glaring deficiency in this type display has been criticized by pilots. The flags are displayed on the face of the instrument not only when a malfunction occurs but also when a component of the system is not turned on.

For example, if an omni station were tuned in, the glide scope warning flag would be displayed. Having warning flags constantly in view like this, when in fact nothing is wrong, tends to detract from the purpose of having the flag in the first place. One gets so used to looking at the flag when the real thing occurs it can go unnoticed.

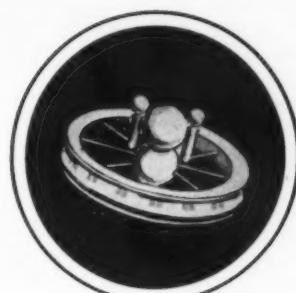
A special industry committee has been studying this particular problem and is of the opinion that the ultimate instrument warning system is one in which "the displays disappear when they are spurious, erratic, or not being utilized, in order to prevent the pilot from developing a tolerance to a signal which could cause him to neglect its warning (e.g. glide scope and localizer warning flags)."

A good interim move

Pan Am is taking an interim step to boost the efficiency of its warning system (complete details on this system appeared last month in *Electronics*). Briefly, PAA has devised a warning light and sound system which will supplement the warning flag. Visual and aural indications are provided on the captain's warning system. The equipment is being manufactured by Gables Engineering in Coral Gables, Fla.

It is too early to judge how effective this system will be. Flashing lights, bells, buzzers, horns, etc. have caused many a pilot's muscle to twitch. As an attention getter we have great confidence that the system will alert the crew. This system, however, adds or subtracts nothing from the basic electronic circuitry or instrumentation. As noted earlier, this is an interim fix. The heart of the problem—the state of the art—still exists.

Pan Am is to be commended not only for recognizing the instrument failure warning problem but for attempting to do something about it. Wholehearted industry effort in this direction might just provide that extra safety and economy we are all striving for.



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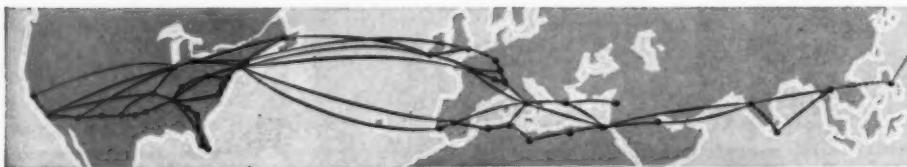


Movies in flight...another TWA first

First-run movies are now being shown on SuperJets. The choicest films from Hollywood and Europe are featured on selected daily flights between New York and California...projected on a special wide screen in the First Class section. Featherweight headsets bring

the sound only to those who wish to see the movie. Others are not disturbed. Starting next month, movies will be shown on most TWA overseas flights. This is the latest innovation to make your flight seem even faster and more enjoyable aboard **TWA SuperJets**.

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AIRLIFT



ABOUT PEOPLE



Bennett



Collin

IN THE AIRLINES

Lord Douglas of Kirtleside will continue as chairman of British European Airways until Dec. 23, 1963, his 70th birthday. He has been chairman since March 1949 and his appointment was due to end next March. The British Minister of Aviation invited him to continue.

Yoshito Kojima, managing director of Japan Air Lines, advanced to newly-created post of senior managing director. **Yasumoto Takagi**, gen. mgr. of the general affairs dept., named executive director.

Capt. R. J. Ritchie, Qantas' director of technical services, appointed deputy chief executive and deputy gen. mgr., succeeding **Capt. G. U. Allan**, retired.

New management of Garuda Indonesian Airways includes: **Capt. Partono Parwito-koesomo**, president; **Capt. Soedarmo**, director of operations; **Dr. S. A. Boerhanoedin**, commercial director; **Dr. Yap Kit Tik**, director of maintenance and engineering; **Usman Sidarta**, director of administration.

William F. Prigge, who joined National in May after 24 years with American, named v.p.-traffic and sales. He succeeds **Charles F. Sharp**, 23-year veteran, who resigned to become president of Woodlawn Park Cemetery Co. **Edward U. Clappier**, who has been advertising production supt. of Pan American's Latin American Div., becomes NAL's advertising mgr. **Harry B. Taylor** becomes secretary in addition to duties as asst. treasurer.

J. Gordon Bennett promoted by American from director of advance schedule development to asst. v.p. for schedule development. Before joining AA last year, he was special asst. to the FAA Administrator. **R. W. Baker**, AA's director of commercial sales, named international sales director. **James J. Mansfield**, agency sales mgr., takes over Baker's former post. **Lionel Rogers** promoted from mgr. of traffic administration and facilitation to director of traffic administration.

Fred A. Collin named cargo sales mgr. of Eastern. He has been mgr. of tariffs, wa with Colonial for several years before me gen. with EAL.

Henry C. Ninas, 19-year veteran with the FBI, becomes North Central's mgr. of ground service, and will be in charge of company security.

John J. Sharkey promoted by Delta from Washington reservations mgr. to asst. to the v.p. in Washington.

Thomas B. Wardell, formerly in passenger service training for United, named supt. of stewardess training.

Frank Menick appointed U.S. passenger service mgr. of Icelandic Airlines. He

was with KLM for 12 years before joining Icelandic in 1957.

Louis B. van Dyck Jr., Utica newspaperman, named news bureau mgr. of Mohawk.

AMONG THE SUPPLIERS

Robert Allen Courtman, senior executive at Armstrong Whitworth Aircraft Ltd., appointed production mgr. of Hawker Siddeley Aviation Ltd. **Roy E. LeLong**, who has been Hawker Siddeley's North American representative for the Argosy and Avro 748, becomes gen. sales mgr. of Armstrong Whitworth.

J. R. Muehlberg promoted from aviation sales mgr. for the Esso Region of Humble Oil & Refining Co. to coordinator of aviation sales in the new headquarters marketing dept. of Humble in Houston, Tex.

W. A. (Bill) Mara retired as director of advertising and public relations of The Bendix Corp. after 17 years with the company. Well known in the industry, Mara had been in aviation since the early 1920s with Stinson Aircraft and Consolidated Vultee before joining Bendix. **Eldon E. Fox** succeeds him.

Edward N. Gomberg, formerly gen. mgr. of west coast operations for Consolidated Diesel Electric Corp., named gen. sales mgr. for the company's aircraft products, headquartered in Stamford, Conn.

Don T. McKone Jr., v.p. of Aeroquip Corp., appointed executive v.p. in charge of domestic manufacturing and sales operations.

O. B. O'Neill, who retired from the Air Force this year, named mgr. of Far East operations of Vertol Div. of Boeing. **R. S. Gates** resigned as executive v.p. of Collins Radio after 27 years with the company. **E. A. Williams**, v.p., assumes central management responsibility for corporate controller and treasurer functions in addition to present activities. **J. B. Tuthill**, v.p., assumes broadened responsibilities in financing and banking relations and financial analysis.

Wilson Alford promoted by Hamilton Standard to chief engineer of ground support equipment dept., and **Charles B. Brahm** to chief engineer of the electronics dept.

OTHERS IN AVIATION

Jack F. Ramsberger, information chief for National Air Transport Coordinating Committee, industry's New York noise abatement panel, named executive director of NATCC, succeeding **Vice Adm. C. E. Rosendahl**, who is retiring.

Charles D. Ewing promoted from asst. mgr. to mgr. of Air Transport Assn.'s western regional operations office. **Warren R. Lasser**, United captain, becomes asst. mgr.

IN THE AGENCIES

Dr. Stanley R. Mohler transfers from National Institute of Health to become director of FAA's Civil Aeromedical Research Institute, Norman, Okla. He succeeds **Dr. Hilliard D. Estes**, appointed chief of FAA's environmental health division.

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RACEP, New Approach to VHF Com

By PHIL GERACI

Few aspects of modern communications have puzzled electronic analysts more than the severe crowding of the spectrum which has occurred since the end of World War II. Lack of space has been particularly serious in airline communications, where reduction of channel spacing from 100 kc to 50 kc and even to 25 kc has been seen as the only solution.

A communications technique just announced by The Martin Co., Orlando, has been offered as one answer to the problem of spectrum crowding. Martin calls the technique RACEP—Random Access and Correlation for Extended Performance—and has developed a small number of working models for demonstration.

In RACEP, voice is converted to coded pulse groups in a time-frequency matrix, then processed for VHF or UHF transmission. The receiver reconstructs the voice message by converting the received information pulses into conventional analog audio signals.

With RACEP a caller can address a specific receiver and be heard by no other receiver on the system. But there is a command override which permits the caller to be heard by *all* receivers.

At peak operation, RACEP can accommodate up to 70 conversations understandably on one 4 mc channel. As the number of simultaneous conversations increases there is a buildup of noise. Ultimately, the noise masks the signal. Martin engineers have estimated that this occurs at about 70 conversations.

Equal to 500-cycle spacing

But the primary advantage of time-frequency sharing is that not all subscribers will be talking at once. Assuming a use factor of 10%, as many as 700 subscribers could be accommodated on one 4 mc channel. This is equivalent to approximately 500-cycle spacing, obviously impossible in conventional discrete-frequency communications.

At maximum capacity—70 simultaneous conversations—RACEP is

roughly equivalent to 50 kc channel separation. But Martin engineers point out that even at maximum capacity not all 70 callers will be speaking at once. RACEP takes advantage of the pauses between words to increase intelligibility.

RACEP still is too new for any concrete applications to have been developed. Martin has announced that it is "exploring" potential applications, and will welcome suggestions.

A variety of uses are envisioned for RACEP in airline communications. In air traffic control RACEP could substantially boost communications capacity in busy terminal areas. In the New York center area, for example, up to 56 simultaneous conversations can take place between aircraft and ground controllers at present, by virtue of the fact that 56 communications frequencies are available.

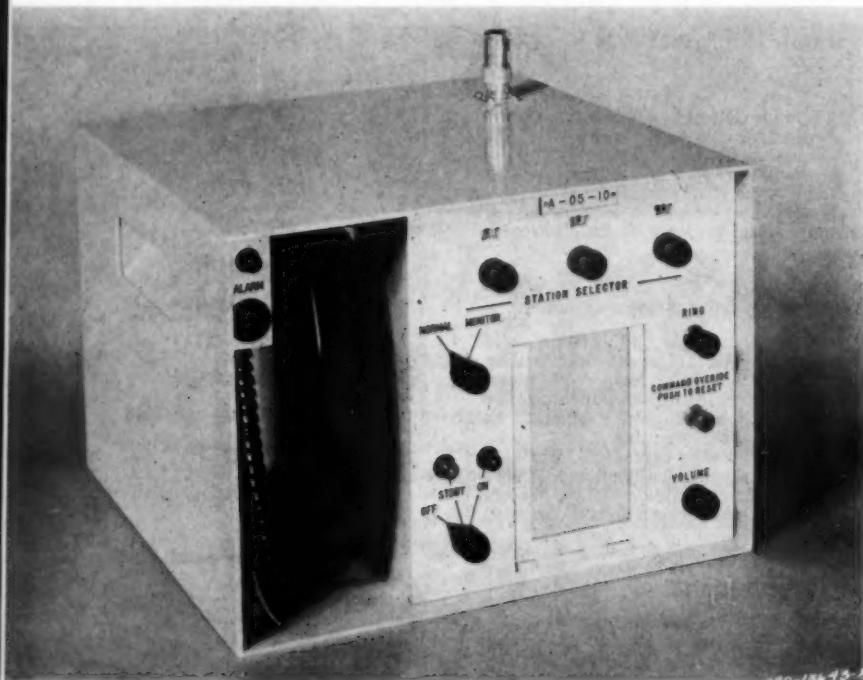
But during a peak period up to 212 IFR aircraft may be under control within the area. By time-frequency sharing, RACEP could accommodate more than three times this number. Even at maximum capacity, RACEP would provide an increase in the number of possible conversations, from 56 to 70.

Air-ground phone potential

Another potential use for RACEP is the public air-ground radiotelephone service still under consideration for airline passengers and executive operators. The chief obstacle to an effective nation-wide passenger telephone system is lack of channels. RACEP may provide an answer, if FCC can supply a channel wide enough for it; only 300 kc are allocated at present.

There also is a growing market for mobile communications at airports. In addition to airlines, who use communications for maintenance and routine servicing on the ramp, potential users would be found in food service suppliers, refuelers, ground transportation services, police and fire departments and a host of others. Martin feels that the field is virtually unlimited, and has been discussing possible applications with a number of airlines.

The first order, for six units, has been received from the Air Force. Delivery will be made by the end of the year. Order number two, just announced, was for equipment to be delivered to the Army Signal Corps.



SELF-CONTAINED transmitter, receiver, power amplifier and antenna are features of new RACEP communications system developed by The Martin Co. Orlando division.

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Checking the Circuit

• Radar techniques which permit storage of information for extended periods, seen as a breakthrough in tube design, may actually hamper some aspects of air traffic control. The problem is one of erasing a part of the display without erasing the total picture. Simplifying displays by removing data for which ground observers need not be concerned is a major consideration now puzzling equipment designers.

• While experiments with the British BLEU (Blind Landing Experimental Unit) continue in England, the British Navy has placed an order with Bell Aerosystems, Inc. for four AN/SPN-10 automatic carrier landing systems. The SPN-10 is the carrier version of Bell's GSN-5, a land-

based competitor of the British BLEU. Leader cables, essential for operation of the BLEU system, cannot be installed on carriers.

• **Runway Visual Range** and Automatic Cloud Height Recording equipment being developed by ACF Industries has been returned from FAA's Atlantic City installation for touch-up on a number of minor details. Now in ACF's Riverdale, Md., plant, final prototype will be returned to FAA in early September, on schedule. Evaluation at NAFEC will follow.

• **RVR equipment** under development by ACF Industries demonstrates trend toward digital display in modern electronic equipment. Meters and dials, prevalent in existing equipment, are giving way to digital displays which reduce reading time and eliminate errors. The trend also is apparent in the cockpit: new DME and doppler radar displays are digital.

• The **DME race** reached the last of the "Big Four" late in June as TWA announced an order for Collins DME to be installed on 47 jets. Previously, a United disclosure that it was buying Collins DME for its entire jet fleet was quickly followed by AA's announcement that it had been using DME in jets right from the start. The next week Eastern disclosed plans for total jet and Electra installations. The TWA announcement is the first, however, to indicate removal of older DME equipment.

• **Breakthroughs** promising relief for crowded communications are on the horizon. Martin Orlando's RACEP (Random Access and Correlation for Extended Performance) announced in early June appeared to be, in effect, a microwave version of a technique featured in Bell Telephone's pulse code modulation, now under development for commercial wire applications. If trends toward greater use of pulse coding continue, need for 25 kc spacing in air-to-ground communications links may be less vital than at present.

• **Conflict over 8800 mc** doppler navigation probably will be settled to the satisfaction of manufacturers who have invested heavily in equipment which operates at the disputed 8800 mc frequency. Hearings into the controversy rehashed the question in early July. Observers reported confidence in an early—and agreeable—solution.

• "Tubes have had it" is the way one electronics engineer phrased his company's outlook on new designs in communications and navigation gear. "Some of our younger engineers have asked for a chance to try their hand at a tube design, simply to find out how they work," he commented, tongue in cheek. But humor could scarcely mask the serious nature of the tube-transistor controversy, as one of the nation's largest tube manufacturers—Sylvania—announced it would abandon tube manufacture once and for all.

• **Technological knowhow** is no stumbling-block in development of future air traffic control systems. Electronics engineers queried at last month's MIL-E-CON meeting in Washington, D.C. cite a variety of new techniques which, they claim, are more positive and more efficient than systems now under adoption or intended for the immediate future. But cost of revamping the existing navaid network would be prohibitive.

• **Transistor noise** still is a problem in radio receiver design. Although advances in solid state electronics have produced transistors which are vastly superior to earlier models, many engineers are convinced the transistor never will equal low-level performance of parametric amplifier.

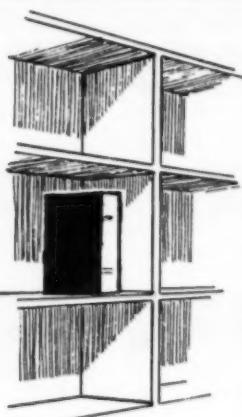
• **FAA's talking exhibit** at electronics shows tells viewers that data processing central, under development by General Precision, is being installed in Boston and will become operational there in mid-1962. But industry is skeptical. ■

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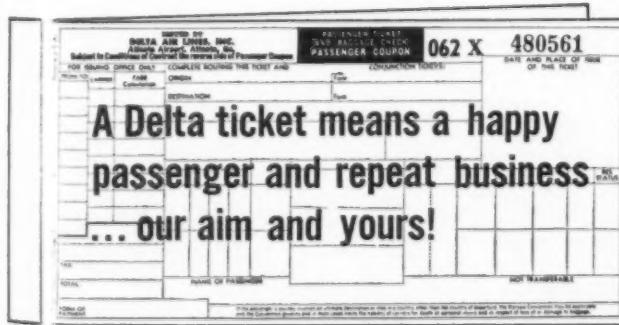
ALASKA AIRLINES
Golden Nugget Jet service



- Present Delta Routes New Transcontinental Jet Routes New Transcontinental DC-7 Routes San Francisco, Sept.

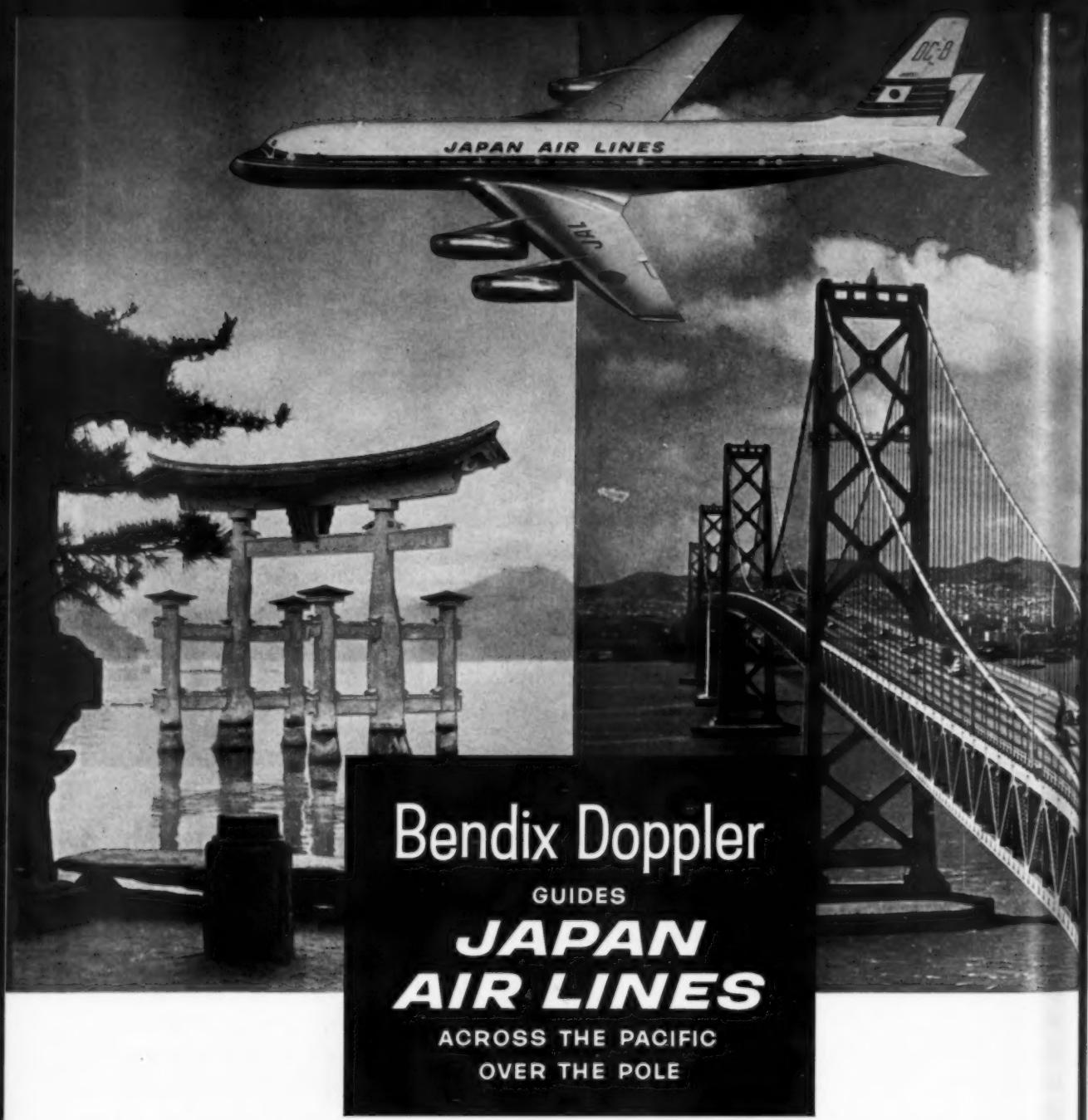
Delta completes the nation's travel picture with a New Southern Transcontinental Jet route...

Now passengers can fly all the way across the southern tier of states on Delta's new southern transcontinental route that serves Vacationland, U.S.A. coast-to-coast! Delta's straight-line skyway between the rich West Coast and the booming Southeast links Los Angeles with jets to Dallas/Ft. Worth, New Orleans and Atlanta. Delta DC-7's, world's fastest piston/prop airliners, fly the route between San Diego, Las Vegas and Southeast. And in September, Delta will start Jet service to San Francisco.



AUG 1 ST, 1961


DELTA
the air line with the BIG JETS
 Your Vacation Air Line



Electronic "eyes" save fuel, time, money on longest over-water routes

Japan Air Lines DC-8C Jet Carriers cross the vast Pacific, then fly on over the Pole to Europe, with a new sureness and ease. Bendix® Doppler Radar Systems give JAL flight crews accurate, continuous ground speed, drift angle, course and distance information. Doppler's electronic "eyes" help JAL maintain most favorable flight paths, increase operational efficiency by decreasing in-flight time and fuel consumption.

Extensive flight evaluations by JAL demonstrated the superior reliability of the Bendix Doppler System. This exceptional reliability plus the many other features of the system such as complete transistorization*, fixed planar array

antenna (only a single antenna is used for dual system installation), and easily-accessible construction have made it the number one choice of the intercontinental jet carriers.

Before making a decision on Doppler, let a Bendix representative give you the full details on the DRA-12/CPA-24 Doppler Radar Navigation System.

*Except for klystron and voltage reference.



Doppler ground speed and drift angle indicator.

← Computer-controller reads out miles-to-go and miles left or right of course.



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CANADA—Computing Devices of Canada, Ltd., P. O. Box 508, Ottawa 4, Ontario



FAA REPORT

By BRAD DUNBAR

Jet Performance And Supersonics Rank High On FAA Rule Roster

FAA has charted two significant new areas of rulemaking of broadest possible impact on airline operations—a "complete review" of SR 422-B performance numbers under which existing jets operate, and a government-industry conference on airworthiness regulations for the supersonic transport. The SR 422-B review is scheduled for the full working week beginning Sept. 11; FAA wants industry opinions on a 118-page "preliminary study" of SST airworthiness, operations and maintenance standards, hop-

ing to publish an Oct. 1 agenda and convene the conference Dec. 5-6. Both will be in Washington.

Administrator Halaby meanwhile put predecessor Quesada's most controversial rulemaking—pilot retirement at 60—firmly behind him with a reaffirmation of the rule in a Senate appropriations hearing. In a letter to ALPA explaining his decision, Halaby termed the rule a "fair and reasonable" if imperfect answer to the question of chronological pilot age.

Another major case—this time involv-

FAA Then and Now

Service seems to be the theme in FAA Administrator N. E. Halaby's reorganization plan as virtually every vestige of predecessor E. R. Quesada's Bureau regime is being changed (even the one which spelled Materiel with an "e"). Here's the new and old lineup of offices:

New

- Air Traffic Service
- Aviation R&D Service
- Aviation Facilities Service
- Flight Standards Service
- Aviation Medical Service
- Int'l Aviation Service

Then

- Bureau of Air Traffic Management
- Bureau of Research & Development
- Bureau of Facilities & Materiel
- Bureau of Flight Standards
- Bureau of Aviation Medicine
- Office of Int'l Coordination

ing a final rule issued after considerable controversy and opposition—saw FAA issue its new "tall towers" regulation in slightly modified form. It met some detailed objections, but still constituted a firm rejection of broadcast industry claims it invades Federal Communications Commission jurisdiction. The rule (1) requires tall structure construction notices to FAA, (2) establishes exact "hazard" criteria and permits exemptions from them, (3) sets rules for informal and formal exemption studies and appeals, and (4) provides standing exemptions for radio-TV antenna "farms."

Other rulemaking:

- Proposed use of standard atmospheric pressure altimeter setting at both intermediate and high altitudes—above 14,500 ft. MSL—to fit FAA's requirements for altimeter settings to the new three-layer airways structure . . . Modernization of regulations governing IFR flight with two-way radio communications out . . . Rewriting of Part 620 of the administrator's regulations to meet Defense Department requests for changes in distant early warning and air defense identification zones (ADIZ and DEWIZ).

VIOLATIONS

The enforcement problem faced by FAA—and by the industry as well—in grounding pilots who meet flight proficiency but not personal character requirements of the CARs was underscored by an FAA certificate action against a former *Southern Airways* pilot. The agency lifted the ATR and medical certificate of Donald E. Stanton with a 36-count emergency



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Now five flights a week to London, Europe and the East

Cargo-coddling jet service Wednesday thru Sunday, leaving New York at 9:30 P.M. Boeing 707 Jets direct to London, Paris, Frankfurt, Geneva, Prague, Rome, Cairo, Beirut, Bombay, Calcutta. From large oil-drilling equipment to small elephants, whatever your cargo, we'll handle it with the care, speed and precision worthy of a maharajah's treasure.

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For information and pickup, call your freight agent or AIR-INDIA Cargo, Plaza 1-4146.



Boeing turbofan jets, fastest airliners in service

The new Boeing 707-120 and 720 "B" models, powered by Pratt & Whitney turbofan engines, are now in service. They provide higher block speeds than any other commercial jet. The 720B is the fastest airliner now in service.

The advanced design of the 707-120B and 720B is based on more than 600,000 hours of Boeing jetliner operations. The advantages of these proved-in-service features are greater schedule reliability and maintenance economy, and higher utilization.

Boeing jets, the most popular airliners in aviation history, have demonstrated outstanding passenger appeal, and greater

earning power than any other jetliner. In addition, the larger cargo volume and larger cargo doors of Boeing jets offer airlines extra earning power.

These are some of the reasons why more airlines have ordered—and re-ordered—more jet airliners from Boeing than from any other manufacturer.

BOEING Jetliners
LONG-RANGE 707 • MEDIUM-RANGE 720 • SHORT-RANGE 727

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revocation order based on his "demonstrated . . . lack of . . . moral character."

His post-war career, according to the FA's order, included a requested Air Corps resignation, two federal convictions and prison terms involving forged checks, two marriages—two of them bigamous—employment and discharge by eight companies and supplemental and cargo carriers; and what FAA described as "consistent patterns of falsehoods," past and present "demonstrated lack of responsibility," and "disregard for morals and the ordinarily accepted standards of human decency.

Stanton was hired by Southern after its ALPA strike began in June, 1960, and was fired by the still-struck carrier "about two months ago," FAA said.

In the field of maintenance enforcement, FAA fined **National Airlines** \$8900, settling four cases in which the agency had sought a total of \$18,500 in fines for a series of maintenance violations in early 1960. **American Airlines** also has paid \$2000 for a series of four 1960 incidents, and TWA has paid the \$1000 fine it had been contesting for improper chocking of a Constellation that fatally injured a flight engineer June 8, 1959.

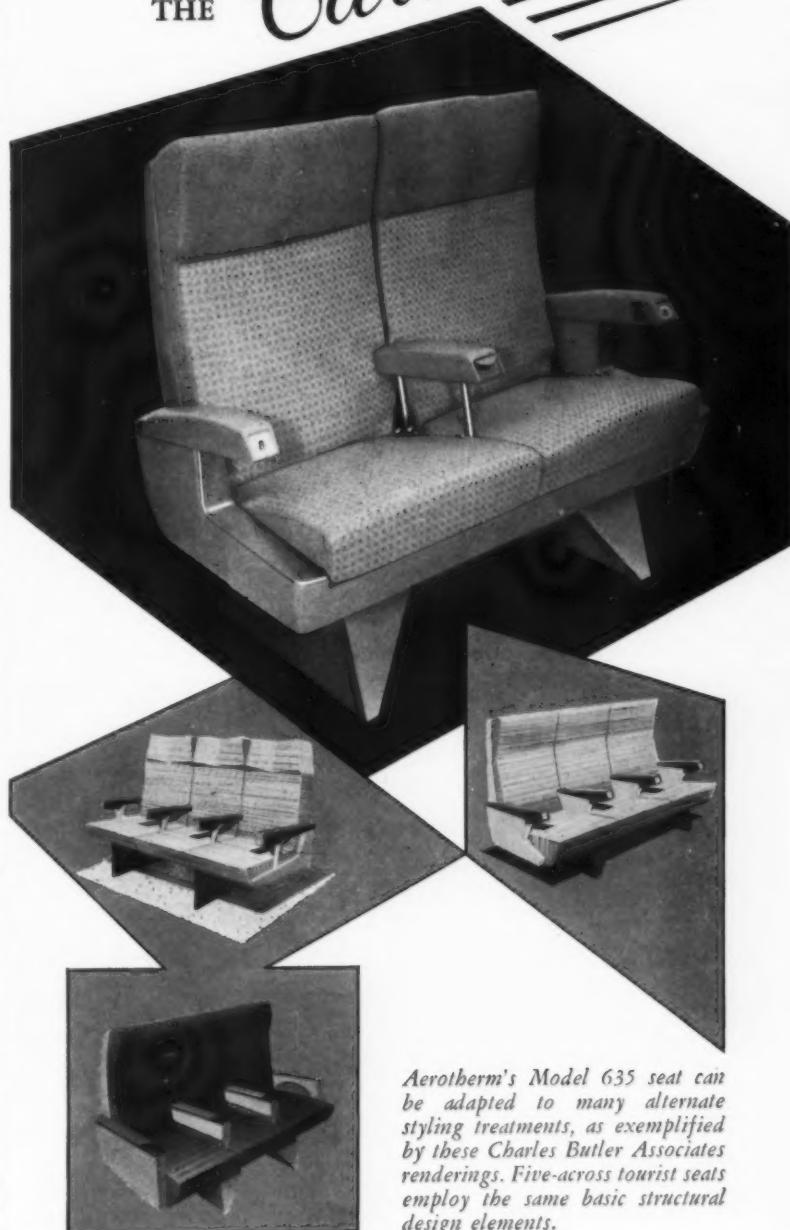
The NAL fine involved failure to meet an airworthiness directive deadline, not making proper reports of engine-out incidents which involved landings at fields not representing shortest flying time, failure to catch a flap malfunction despite repeated pilot "squawks," and some eight other incidents. The American penalty was for miscellaneous incidents.

Heavy enforcement schedule

* Other violations: A \$1000 fine paid by **Frontier Airlines** for using altered landing gear compensating cylinder eyebolts . . . A \$200 fine from **Southern Airways**' Capt. **Conrad J. Leonard**, New Orleans, for cancelling his IFR flight plan during ILS approach and landing at Monroe, La., Aug. 28, 1960, when the field was below his weather minimum . . . A \$250 fine from **Pan American** Capt. **R. W. Greenwood**, Huntington, N.Y., for an ATC conflict with an aircraft 1000 ft. above his cleared altitude . . . A \$250 maintenance fine paid by **Northeast Airlines** for an Aug. 2, 1960 incident, in which a Viscount aborted a flight because of in-flight elevator vibration caused by an inspection plate found bent and with nine of its 11 screws missing . . . A \$100 fine from E. L. Sighin, Kansas City, Mo., TWA inspector held responsible for a mechanic who failed to catch the reverse installation of the right main gear upper torsion link bolt on a 707, causing in-flight loss of the right fillet flap by severing of its torque tube . . . A \$100 fine from Capt. **Jean D. Brayton**, Hayward, Calif., pilot-in-command of a **Zanop Air Transport** aircraft which was damaged in a Nov. 4, 1960 ramp accident in which the nose gear was retracted by actuation of the landing gear rather than the flap control lever . . . A \$150 fine paid by Earl S. Martin, Springfield, Va., lead mechanic on a **Capital Airlines**' DC-6B who was charged with assigning two insufficiently experienced mechanics to replace an engine cylinder, and with failing to properly supervise their work . . . A \$100 fine from Las Vegas Hacienda, Inc., Long Beach, Calif., for omitting a radio inspection in a No. 3 check on a DC-3 Feb. 1, 1961, and later failing to log a similar inspection . . . A \$100 fine from TWA maintenance foreman E. McManus, Mineola, N.Y., blamed by the agency for not checking the security of a 707's air conditioning service door which came off in flight, landing on a Flushing rooftop.

SPECIFICALLY FOR..

THE *Caravelle*



Aerotherm's Model 635 seat can be adapted to many alternate styling treatments, as exemplified by these Charles Butler Associates renderings. Five-across tourist seats employ the same basic structural design elements.





NEWS IN BRIEF

EQUIPMENT

Brussels—Sabena has ordered two Caravelle VIIs raising its fleet total to eight.

Canada—Canadair's CL44 has received its full certification from Canada's Dept. of Transport.

Tokyo—Japan's Defense Agency has ordered ten Nihon YS-11 twin Dart powered turboprop transports.

Puerto Rico—Indies Air Inc., new applicant for routes in the Caribbean has signed a letter of intent with Kaman Aircraft Corp. for five Rotodynes. Indies Air is a joint project backed by Puerto Rican, Virgin Island and U.S. interests. President is Sterling Pile, New York.

Great Britain—Frontier Airlines, Denver-based U.S. local airline, has signed a letter of intent for six British Aircraft Corp. BAC-111 small twin-jets. Deal is valued at about \$12 million.

London—Overseas Aviation, British independent, has bought 15 North Stars from Trans Canada Air Lines.

U.S.—Pan American is modifying three additional DC-7Cs for cargo service under contract with Douglas which calls for structural beef-up for higher zero

fuel weight and installation of new Air-Pak palletized preloading system. Douglas also will produce kits for Pan Am modification of its other 10 DC-7Cs which originally were converted to cargo by Lockheed Aircraft Service.

Continental Air Lines is modifying its 707s to use a higher thrust JT3C engines and lower-drag sound suppressors. The engine change improves speed about 12 mph and the suppressors 8 mph, giving CAL a 20 mph gain.

Allegheny Airlines has purchased four Martin 202As at about \$70,000 each, says it will retire all but one of its DC-3s. Remaining fleet will be five 540s, eight 440s and 16 Martins.

American Airlines has modified its Electras to mixed class service—17 coach seats forward and 54 1st class aft. It previously used 68 first-class seats.

AIRPORTS

Washington—New three-year leases now under negotiation will raise landing fees to 15c/1000 lbs. and terminal space to \$3.50-\$3.75 per sq. ft. Present rates average 7¢ and \$2.10 respectively. Government expects to reap a \$700,000 profit next year from the increases.

Miami—A U.S. court has ruled that

the Dade County Port Authority violated a 1945 U.S.-Latin America trade treaty by charging eight non-U.S. airlines \$2 per ton of cargo and 50¢ per passenger carried into Miami International Hotel. It ordered return of \$669,425 plus about \$100,000 in interest to: RANSA (\$207,357); Guest Aerovias (\$183,726); TAN (\$128,011); Varig (\$74,565); Aerovias Panama (\$30,723); Aviateca (\$28,257); CEA (\$12,498) and Lloyd Aereo Colombiano (\$4287).

Atlanta—New 150-room Air Host Inn motel due to open adjacent to Atlanta's airport terminal will include an Air Hostess Club in the form of a cottage by the pool for use by airline stewards during layovers and days off. Owners are Julius Epstein, Chicago and Fertman Corp., New York.

Eastern Air Lines will build a \$3.7 million hangar and maintenance center for occupancy by Fall 1962.

San Francisco—New \$8 million south terminal has entered the construction stage and is due for completion by 1963. Tenants will be American, Qantas, BOAC, Lufthansa, TWA and Japan Air Lines.

Honolulu—A \$45,000 rhubarb has developed here as Aloha Airlines refuses to move into the airport's new \$750,000 Inter-Island Terminal until the Hawaiian Aeronautics Commission comes up with a 36-foot extension to its portion of the terminal. Hawaiian Airlines has already shifted its operation into the new facility.

CARGO

London—BOAC has become an associate participant in Air Cargo, Inc., U.S. domestic airlines' pick-up and delivery organization. Other associates are Air France, Pan Am, SAS, Seaboard World Airlines and Trans-Canada.

RESERVATIONS

U.S.—Delta Air Lines became the second airline (American was No. 1) to sign up for IBM's Sabre reservations system and the first to hint it might buy instead of lease the highly advanced system. Sabre would cost Delta about \$2 million a year to lease and about \$8.5 million to buy. Delta's Sabre will represent about 1/3 of the size of AA's.

Eastern Air Lines picked Charlotte, N.C. as the reservations center for its entire system and will install a Univac 490 Real Time reservations system there before the end of the year.

MISCELLANY

Supplements—Eyeraiser of the month was the appearance of two former CAB enforcement heads, James Anton and Robert Fraley, to testify before a Senate subcommittee on behalf of two supplements—Mantz Air Service and Quaker City Airways.

Both Anton and Fraley are associated with Keatinge and Older, west coast law firm which has represented Great Lakes Airlines. The latter has been involved in a court battle on a CAB enforcement action that would put it out of business. Mantz and Quaker City recently dusted off their certificates and resumed operation after a long period of inactivity.

SILICONE NEWS from Dow Corning



Photo courtesy of Douglas Aircraft Company

Fuel Resistant O-rings for Jets

The DC-8 Jetliner uses more than 500 flexible couplings on fuel lines. Leakage at any coupling is prevented by two rubber O-rings that must retain their rubbery properties and continue to seal as an O-ring should, despite constant contact with jet fuel.

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the market: Your 1st opportunity to exclusively reach the \$2 Billion* world air transportation accessories & ground equipment market....

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- \$472,000,000 Airports & airline facilities
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the need: For the industry... a complete buyers' source for information on accessories and ground equipment

For the supplier... a specialized "market place" in which to reach the world air transportation market... with a full year of advertising effectiveness at a one-issue cost

publishing: October, 1961

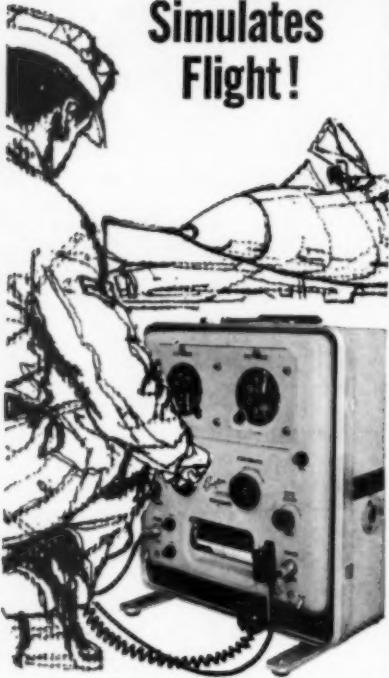
closing: September 5, 1961

airlift
WORLD AIR TRANSPORTATION

... the only publication edited exclusively for the world air transportation industry

* AIRLIFT estimates based on CAB and FAA figures.

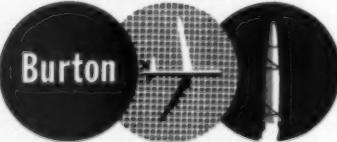
One Man... One Unit Simulates Flight!



Burton FLIGHT CALIBRATOR checks out all pressure and vacuum equipment...

In pre-flight or maintenance applications, one man with this one portable unit, the new Burton Pitot-Static Tester, can check out and calibrate all pressure and vacuum equipment on high performance aircraft with precision and accuracy. In-flight conditions encountered by precision instruments are reproduced with high accuracy and repeatability in these ranges: Altitude, -1000 to +80,000 feet; airspeed, 0-850 knots; Mach number, .3 to 2.2. Built-in, automatic safety features prevent damage to critical instruments; use of dry pump prevents oil contamination. Portable case contains precision aircraft instruments, pressure and vacuum pump, valves, regulators, hoses, electrical cable; weighs 60 pounds total. Unit operates on 115 vac, single phase, with automatic selection of 50/60 or 400 cycles.

FOR PRECISION CHECKOUT AND CALIBRATION



BURTON INSTRUMENTS
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Airport heaven?—A U.S. shopping center group, reports *The New York Times*, has formed a subsidiary whose sole task is buying up airports which are threatened with abandonment. There's good reason, the group explains: Most airports are served by good highways, have large parking areas, flat terrain that is easy to build on and usually present no zoning difficulties.

Market Survey Report—U.S. Department of Commerce Business & Defense Services Administration has published a 19-page report "World Survey of Civil Aviation—Southwest Asia." Order from Supt. of Documents, Govt. Printing Office, Washington 25, D.C. at 15¢.

ELECTRONICS

FAA now is conducting pilot-forecaster weather service in the Washington, D.C. and Kansas City ARTC areas. Frequency is 122.6 mc. The service is available to all segments of aviation, provides specialized data on local weather conditions.

Bright display equipment for 19 FAA Air Route Traffic Control Centers will be provided by Raytheon under a recently-signed \$11.6 million contract with FAA. The contract covers 40 systems. Equipment converts radar signals into TV presentations, provides for variety of new techniques in target identification.

FAA has received Air Force's AN/GSN-11 "Volscan" unit at its experiment center at Atlantic City. Avco unit will be evaluated for use in both civil and military air traffic control systems.

Second doppler VOR—located on Rikers Island near LaGuardia Airport—was scheduled for commission August 1. First unit, located at Marquette, Mich., was commissioned a month ago. FAA now is studying a "dozen or so" VOR installations which present troublesome siting problems.

FAA has installed a waveguide localizer at Minneapolis International Airport, restoring the city's full ILS system for first time in more than a year. 117-ft. long antenna system overcomes bending of localizer beam due to construction of new hangar. First installation was at Meacham Field, Ft. Worth.

Waveguide localizers also will be installed at Washington National Airport, Chicago Midway, Harrisburg and Williamsport, Pa., Miami International, Los Angeles International, Seattle and Juneau, Alaska.

Electronic Equipment Engineering, Inc. of Dallas has appointed Field Aircraft Services, Ltd., of London as its United Kingdom sales agency. Electronic Equipment makes a variety of airborne equipment for aircraft.

Marconi closed-circuit television system has been installed at Southend Airport in England. Equipment is used to view a busy intersection not directly visible from the control tower.

First Russian order for aircraft flight instruments made in the West has been placed with Britain's Smiths Aircraft Instruments Ltd. Order is for 45 Kelvin Hughes 50,000 ft. altimeters to be installed in Aeroflot aircraft operating into Western Europe. New instruments will simplify calculations for Russian pilots whose own instruments are calibrated differently. ■

Braniff Tops 'On Time' List Western Ahead With Jet

Braniff Airways and Western Air Lines took over the top spots in "on-time" performance during April. United led in Boeing 720 operations, Delta with 880s and American with Electras. Two locals, West Coast and Piedmont, had 100% "on-time" records, the first since the statistics have been reported.

ON-TIME BOXSCORE

APRIL, 1961

Airline Ranking	Total Flights	On time to 15 min. late
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TRUNKS

1 Braniff	1305	85.9%
2 Western	712	83.2
3 United	4577	83.1
4 Eastern	4234	81.5
5 American	5926	80.8
6 TWA	2589	76.4
7 National	605	74.5
8 Continental	1454	72.17
9 Capital	2228	72.16
10 Northeast	2854	65.4
11 Delta	1842	64.6
12 Northwest .....	...	Strike

707 & DC-8

1 Western	177	85.8%
2 Eastern	764	77.0
3 TWA	923	76.26
4 Braniff	227	76.22
5 United	1377	75.7
6 Continental	480	73.9
7 American	1285	72.9
8 National	309	67.3
9 Delta	399	51.6
10 Northeast	52	38.4
11 Northwest .....	...	...

720

1 United	498	84.9%
2 Capital	154	77.9
3 American	617	60.4

880

1 Delta	550	57.4%
2 TWA	203	51.2
3 Northeast	589	34.2

ELECTRA

1 American	1201	86.0%
2 Braniff	105	85.7
3 Eastern	520	83.4
4 Western	319	81.1
5 National—No non-stop or one-stop service	...	...
6 Northwest .....	...	...

LOCAL SERVICE

1 West Coast	230	100% *
2 Piedmont	29	100% **
3 Frontier	225	89.3
4 North Central	1129	81.0
5 Allegheny	563	79.7
6 Pacific	166	79.5
7 Southern	283	79.1
8 Central	133	72.9
9 Lake Central	431	68.4
10 Bonanza	379	66.7
11 Mohawk	751	65.9
12 Ozark	691	63.9
13 Trans-Texas	220	54.5

SOURCE: AIRLIFT Research.

*Only 1 Flight not within 5 min.

**Only 3 Flights not within 5 min.

MAINTENANCE / OVERHAUL



United Buys Aerotherm For Caravelle

United Air Lines has placed a \$1 million order with the Aerotherm Division of Aerotec Industries, Bantam, Conn., for seats to be used in its first 20 Caravelles.

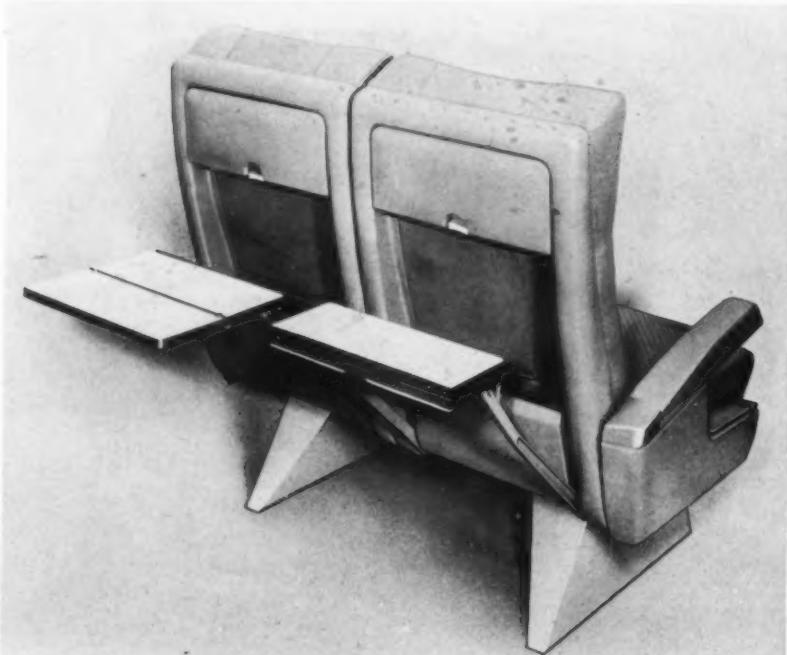
The new seats feature an increase in "shin room" achieved by eliminating the stretcher commonly found in conventional designs at the seat and back juncture. This was done through the use of beam construction, providing high strength at low weight along the seat front. Aluminum forgings that extend aft from this beam carry the seat back structure of aluminum alloy sheet formed with large radii for delethalization. The result is a lightweight unit that accepts usual stresses, yet enhances occupant comfort through increased leg room.

Also different and unusual is the Aero-table. After release, by turning a latch, the table is brought into horizontal position with a counter-balance control. It can remain small in area, or it can be unfolded to give twice the area for dining.

The magazine pocket also is expandable. It offers the strength and neat appearance of molded plastic, and is easy to clean.

Energy Absorption, pioneered by Aerotherm, provides occupant protection. Sudden loads in excess of 9g will extend the "inner" tube of the rear legs of the seat and maintain a constant resistance (9g load) on seat and occupant.

Automatic oxygen facilities, designed by Aerotherm jointly with Aircraft Equipment Division engineers and manufactured by the latter, are recessed in the back of each seat. Cabin depressurization auto-



NEW SEAT developed by Aerotherm for United's Caravelles features a dual purpose table. It can be kept small in size or folded out full for dining.

matically releases oxygen masks. Mask and oxygen also are manually available if needed for first aid.

Positioning of the back for recline up to 45 degrees with an intermediate position of 35 degrees is controlled by fingertip pressure on the recline button. Automatic return of the seat upright is achieved by the recline button, although the recline position lock has an override feature permitting the back to be pushed to an upright position without depressing the button.

Upholstery of apricot check fabric is

used for United's seats, highlighted with an oatmeal color fabric balanced with appropriate shades of bisque and off-white Boltaron trim. In alternate rows, blue check fabric is used.

Aerotherm's "sculptured upholstery" technique is used to bond castings to metal surfaces, including those subjected to deep forming. Aerotherm's records show that trim covered by this method resists impact from feet and luggage, stresses from sitting on armrests, frequent folding of backs and seat legs and similar usage.

Mechanical Intelligence . . .

A review of FAA daily mechanical reports for the past 30 days discloses the incidents of interest to airline engineers and maintenance specialists. **Jet contamination**—After 707 takeoff from Los Angeles, loss of hydraulic fluid necessitated emergency gear extension and use of air for brakes on landing. Hydraulic pump failure had allowed Skydrol to contaminate engine

oil creating a heavy rubber-like substance. Engine was changed.

At Dallas, a Lockheed Electra experienced turbulence estimated by pilot at 1.5g to -1g. Recorder showed 4.3g to -0.5g.

At Miami, during refueling a 707, fuel overflowed through vent and ignited resulting in buckling damage to No. 1 engine cowling.

At San Francisco, No. 4 engine of a 720 was shut down as reverse light came on when aircraft started to rotate. Check showed engine was in reverse due faulty thrust reverser selector valve.

At Atlanta, a complete electrical system failure on a DC-8 was traced to No. 2 generator failure and a differential current fault sensed by the No. 4 generator. No. 1 and 3 generators then tripped on over voltage.



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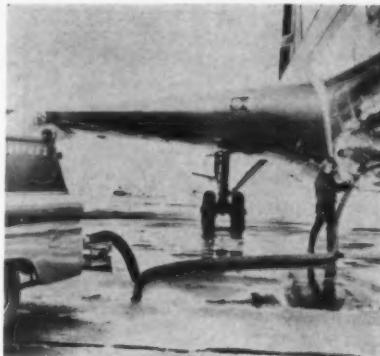
NEW PRODUCTS

Storage Tube

A two-in-one storage tube for converting one type of scan to another has been developed by Allen B. Du Mont Laboratories (Division of Fairchild Camera and Instrument Corp.). The Type K2070 is a non-destructive read-out, double-ended, electrical input-electrical output storage tube.

The tube is capable of resolution in excess of 1000 TV lines at 50% modulation. Information can be retained for hours, erased in a second, or caused to decay at a controlled rate while new information is superimposed. It can be used for data transmission and storage or for converting from one scan frequency to another, as in radar PPI to TV scan. An integrating characteristic enables build-up of repetitive signals while noise surrounding them is scrambled or maintained below the cut-off level.

With the K2070 it is possible to change the on-and-off pips of a radar screen to a complete television type picture of surrounding terrain together with all targets (including aircraft) in range.



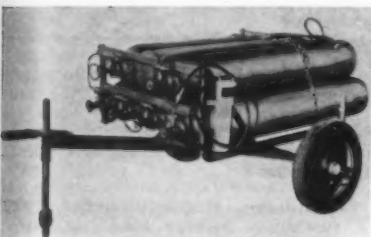
Starter Duct

Jet Starter Duct

A jet starter duct is being made by Flexible Tubing Corp. and is offered for airline use. It is made with a liner of silicone rubber formed by a process which insures no thin-wall spots. The liner is bonded to an outer sleeve of Dacron.

Each duct has a replaceable jacket of rubber supported by a Dacron fabric. The jacket resists moisture, mildew, fungus and extremes of temperature. A damaged jacket is easily replaced.

The duct is 30% lighter than previous Flexible Tubing models. All starter ducts are guaranteed for one year. Diameter is 3½ in. Lengths up to 30 ft. are available, with or without standard end fittings.



Oxygen Trailer

Oxygen Servicing

A simplified servicing trailer for recharging of oxygen or nitrogen cylinders is available from Zep Aero. The trailer contains all equipment necessary to recharge aircraft fitted with outside filler valves.

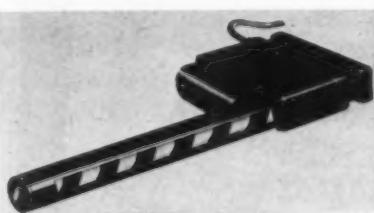
The trailer is designed to carry seven large cylinders, six for oxygen and one for nitrogen. Adapters included with the trailer permit filling portables of various types. Bottles are not furnished with the unit.

Navigation Computer

A special kit to shorten the cross track and/or along track readings of General Precision's TNC-50 Track Navigation Computer has been developed. Along-track reading may be changed from a maximum 999 to 99.9 while maximum cross-track readings may be changed from 99 to 9.9 miles.

The changes have been found necessary in aerial surveying and map making, where extreme accuracy is necessary. Accuracy for standard TNC-50 readings is 0.2% plus or minus $\frac{1}{16}$ nautical mile, based on perfect inputs. With the modification, the $\frac{1}{16}$ nautical mile figure is eliminated.

The TNC-50 computer is used with GPL RADAN 500 and APN-102 doppler navigators.



New ILS System

Para-Visual Director

Smiths Aviation Div. has disclosed further details of its Para-Visual Director system of flight control slated for installation in the de Havilland Trident. The PVD system consists of a cockpit display composed of three "barber-pole" indicators positioned in front and to each side of the pilot.

When the indicators are connected electrically with the aircraft's vertical gyro, compass system and glidepath and localizer receivers they serve to alert the

pilot to deviations from a prescribed flight path by rotating and thereby appearing to move forward, backward, or to right or left.

The indicators are not designed for constant scrutiny. Rather, they serve as "para-visual" (to the sides) devices intended to catch the pilot's eye even though he is looking elsewhere. Noting movement of the barber-pole indicators, the pilot moves the control column in the direction of indicator movement until the movement stops.

The first commercial transport equipped with PVD indicators is a DC-8 operated by KLM. The Dutch airline is evaluating the system's potential for full fleet implementation.

Tape Reproducers

A new eight-track tape reproducer manufactured by Gables Engineering, Inc. permits a stewardess to select a variety of airborne background music. If the aircraft is flying to Latin America, Latin rhythms can be selected. En route to New Orleans, Dixieland jazz could be heard over the loudspeakers.

The reproducer uses half-inch tape which will accommodate up to an hour's operation without attention. Each program uses two tracks (permitting stereophonic playback, if desired). Up to four hours of different music can be selected by a stewardess at the touch of a button.

The tape plays in both directions, eliminating the necessity to rewind. An automatic shut-off operates in case of tape breakage.

Airborne Receiver

A tiny receiver the size of a transistor portable radio has been developed by Sylvania Electric Products, Inc. for airborne use. The unit is designated to function for more than 10,000 hrs. (nearly 14 months) without failure.

The transistorized unit presently is undergoing a life endurance test in which it has worked continuously for more than 8300 hrs. This compares with a current figure of 540 hrs. average time between failure. It is intended that the receiver ultimately will incorporate micro-miniautized electronic circuits.



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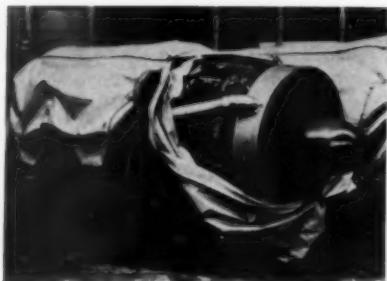
Willow Run Airport
(Great Lakes Airmotive Division)
Ypsilanti, Michigan



Jet Engine Containers

Re-usable, zippered, flexible, plastic bags are offered by Navan Products, Inc. for moisture-free storage of jet engines. Developed in England, the preservative containers have been in use there for some time. Navan (invention marketing subsidiary of North American Aviation, Inc.) will market the containers in the U.S. by agreement with the English patent owners.

"Drilad" containers will sell for approximately \$200 in a size to fit a typical aircraft jet engine. The containers will hold a vacuum or withstand pressurization. Construction varies according to the degree of vapor proofing required.



Jet Container

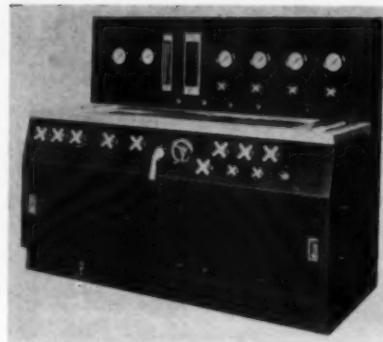
Test Stand

A self-contained hydraulic test stand—Model HC20-5M—is offered by Aerotest Laboratories to test and calibrate a variety of hydraulic components.

The stand has a four-way selector valve for directional flow cycling; accumulator to dampen line shock and pump pulsations; panel-mounted hand wheel volume control; pressure gauges with shutoff valves; stainless steel tubing and drain pan; reservoir furnished with drain valve sight gauge and filter.

The following test ranges are provided:

- Flow: 0-20 gpm @ 5000 psi;
- Pressure: 0-5000 psi; automatic temperature control;



Test Stand

- Hydrostatic pressure: 10,000 psi;
- Pump: variable volume;
- Fluid Filtration: 10 microns;
- Flow meters: 0-5 gpm, 0-20 gpm, plus or minus 1%.

Narco DME

Narco is now offering distance measuring equipment priced at \$2250—model UDI-2 DME—with a range of 100 nautical miles and a weight just under 16 lbs. It includes a panel unit weighing 7.8 lbs., a remote unit weighing 5.1 lbs., and an antenna (0.25 lbs.) plus shock mounts and connecting cables.

The unit will tune 100 DME channels—108 to 117.9 mc—paired with VOR channels. Range accuracy is 0.5 miles (3%). Transmitter output is 50 watts minimum, 75 watts nominal.

Maximum search time is 30 seconds. Tracking speed is greater than 400 knots. Memory hold is 8 to 12 seconds after loss of signal. The unit requires 13.75 v at 8.5 a, or 27.5 v at 4.25 a.

Airport Lighting

An airport lighting fixture capable of withstanding the impact of the world's heaviest aircraft is being manufactured

For further information on items mentioned in Equipment World, write: Readers' Service Dept., Airlift Magazine, 1001 Vermont Ave. N.W., Wash. 5, D.C.

by Sylvania Electric Products, Inc. for imbedment in airport runways and taxiways. The fixture is made to FAA specifications.

The fixture is round and flat, resembling a pancake. It is made of cast iron or steel, is seven and 15/16 in. in diameter and approximately one and a quarter to one and an eighth in. thick, depending on specifications.

The lamp used in the "pancake" is permanently sealed and protected in silicone rubber as an integral part of a replaceable lamp strap assembly. All fixtures contain an open-type lamp compartment. Lamp replacement requires removal of a strap by means of two screws. Replacement time is about 15 seconds. Filter colors are blue, red, amber and green.

BOOKS

Mechanics—Book dealing with assembly, maintenance, airworthiness and operation of aircraft is 4th edition of Aero Mechanic's Questionnaire, by Ralph Rice. At \$6.50 volume is available from Aero Publishers, Inc.

Stewardesses—Heavily illustrated survey of stewardess training aimed at career planning—*Airline Stewardess*, by Jack Engeman—is offered for \$3.50 by Lothrop, Lee & Shepard Co., Inc., publishers.

Aerospace Facts and Figures; Aerospace Industries Association, Distributed by American Aviation Publications, 1001 Vermont Ave. N.W., Wash. 5, D.C. The 1961 edition of *Aerospace Facts and Figures* is a statistical and narrative account of changes in the aerospace industry. This official A.I.A. publication covers production and facilities, military aviation, research and development, manpower, finance, and aircraft deliveries.

The Seven Ground Instructor Ratings; Charles A. Zweng, Pan American Navigation Service, 12021 Ventura Blvd., North Hollywood, Calif.; \$5.00. Revised 10th edition helps prepare candidates for written examinations leading to ground instructor certificates. Ratings covered are Aircraft; Aircraft Engines; Meteorology; Navigation; Radio Navigation; Link Trainer Instructor; and Civil Air Regulations. Treatment employs multiple-choice questions (with answers) similar to those given by FAA for each rating.

Numerical Weather Analysis and Prediction; Philip D. Thompson; The Macmillan Co., 60 Fifth Ave., New York 11; \$6.50. This is the first book-length treatment of new techniques for weather forecasting which rely on high speed digital computers. The book emphasizes how computers have accelerated weather forecasting procedures covering both theoretical and practical aspects of computing. Although the book covers much that is highly technical, the approach is from the standpoint of the nonspecialist.

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A Movie in Johannesburg ... Reserved for Torture

There being no TV as yet in South Africa, the movies are a big enterprise. There are many fine, large theatres in Johannesburg but you've got to go through some painful experiences before you see the main feature.

There are no continuous movies. Performances are at 2:15 and 8 p.m. and tickets are reserved and largely sold in advance. If you haven't bought in advance you wait in the lobby until the advance purchasers have all gone inside and then buy what's left at the box office.

So far as I could see you're a sucker to buy in advance because once you're inside you sit through fifteen minutes of advertisements, either slides or film. Then a batch of short subjects begins and at this point in come all the late purchasers and you have to get up and let people through, or the screen is hidden by others standing in front. Most annoying.

After a solid hour of ads and short subjects—some of these latter are actually ads, such as a travel short which brought Coca Cola bottles unsuitably into view every minute or so—there is a 15-minute intermission. Half the audience proceeds to the lobby and the selling begins in earnest. There is one counter for ice cream in various forms, several counters for candy of a jillion kinds, and another counter for cold drinks. But lest somebody be left unsold, there are girls hawking ice cream and stuff up and down the aisles. Ads are shown on the screen for the entire break, and the sell isn't exactly soft.

At last, the feature

I've never seen so much captive selling anywhere. Ultimately, having paid a fairly stiff price for the feature, you are permitted to see it. Smoking is permitted throughout the theatre so you see the film through a haze. In olden days they used to play "God Save the Queen (or King)" at the end of the show, but no longer since South Africa left the British Commonwealth. The cinema is a big night out in South Africa and the theatres ought to be cleaning up—until TV arrives.

The Carlton in Johannesburg is a first class hotel. Perhaps the service isn't quite as posh as it once was, but the dining room is fine with excellent meat and Italian dishes. The rooms are comfortable and the baths spacious. The hot water is scalding, so hot that I found it easy to make coffee with my instant packages in the mornings. More native help is being used than before.

No one can be long in Johannesburg without noticing flowers. Both here and in Pretoria, the capital some 20 miles north, flower arrangements outside and inside the home are of the utmost importance. To decorate the home with flowers when having guests is a mark of distinction and the housewife apologizes



WWP with the Cape of Good Hope, southernmost tip of Africa which divides the Indian and Atlantic oceans, in right background.

for it before anything else, at which point the guest naturally is expected to rave about her décor.

There are still some thatched roofs to be seen on fine houses, but insurance rates are going higher all the time. The owners live in terror on Guy Fawkes' Day, when fireworks are going off in profusion, and just about every year another house or two burns down because a rocket falls on the inflammable roof.

Jan Smuts Airport at Johannesburg has a fine, long jet runway and a terminal that somehow seems unusually bleak. And do you know something? There isn't a single, solitary water fountain in the entire terminal.

Also, there are only two gates to the airplanes and no signs, only oral announcements. It is amazing how much confusion is caused by the absence of a simple system of posting flight numbers, times and the names of airlines, with a light to indicate boarding has begun.

It had been 14 years since I had last been on South African Airways so the Viscount flight from Johannesburg to Capetown was something of a new adventure. It was a breakfast flight with two stewards and a stewardess and I couldn't help but wonder why three were needed on this 2 hour and 40 minute flight when one stewardess could have handled everything easily without any rush at all if the service were properly organized.

After takeoff one steward passed the standard sugar candy. The stewardess made the cabin announcements and then

passed the magazines.

What happened after that was extraordinary.

First, the stewardess made one round of the cabin with plastic trays and fancy paper doilies to put on the pull-down seat tray. (I don't know about South Africa, but those doilies are expensive in the U.S.) Then a white-coated steward made a complete round of the cabin with a knife, fork and spoon in cellophane wrappers.

Cups and coffee, but . . .

Next a steward came up the aisle with a tray of cups and saucers and coffee, and poured coffee for each passenger. Since he was trying to perform like an acrobat with cups, saucers and coffee on one tray, he naturally ran out of something three or four times and had to go back to the galley for refills. (Meantime, those up front would kinda like a little coffee.)

Now heed this one: the guy who brings the cup, saucer and coffee, doesn't bring the sugar. No sirc. That's the job of the stewardess who makes a complete round of the cabin with sugar dispensed individually from a container of some sort. But she also passes out some teeth-breaking rusk, purpose of which, I gathered, was to get those teeth sharpened for later use in tiger hunting.

In due course, and by this time it is really due course, what with three attendants making vast motions up and down the aisle with miniature results, a steward comes by with a tray of hot sausage rolls. I must confess the sausage was most awfully good, too. But there was no second cup of coffee. And the plastic tray was ridiculously small and inconvenient. So thus ended Round One for the 56 passengers on board.

After picking up the trays, the cabin crew regrouped and the passengers resumed reading the morning papers. But it wasn't long before the routine started all over again. It was time for "morning tea", or pre-luncheon tea, or whatever it was. Anyway, I would have liked a second cup of coffee. But it was a pleasant flight and sometime in mid-morning we set down at Capetown after getting an air view or two of that beautiful part of the world.

A left side debut

I had arranged in advance for a car and driver from African Car Hire, a well-known outfit that provides everything from drive-yourself cars to limousines for safaris far into Central Africa. It has offices in most South African cities. Since I had never driven a car on the left side of the road anywhere in the world, I decided to make my debut in South Africa which follows the British "wrong side" system. But for a tour of the city and the drive to Cape of Good Hope, I wanted somebody else at the wheel. So, on hand to meet us was Hassel, a Dane who has driven for African Car Hire for many years, who is a fine driver and an excellent guide, plus being a very nice guy.

One can rhapsodize for a long time about Capetown and its surroundings. The city and its docks are sprawled along the coast below a huge rock bluff. There are fine beaches and big new apartment buildings. The city itself gives you a lift, with lots of traffic, double-deck buses, plenty of good stores, and some good drives to take. Views are abundant.

It is a much nicer place than Johannesburg. ■

News of Local Service Airlines

Texaco offers this series of informative bulletins in recognition of the vital new dimensions being added to business activity by Local Service Airlines. Texaco Inc., Aviation Sales Department, 135 East 42nd St., New York 17, N. Y.

Texaco tells business and government leaders about the vital contribution of local airlines to American business activity through regular ads like this in **Business Week.**

This new campaign reports on ways to use local carriers to increase sales, reduce costs, solve problems, plan promotions, or relax.

Texaco is proud of its close association with the progressive airline industry.

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West Coast
Wild Alaska

Reindeer take to the sky . . . on F-27. Reindeer can fly — Northern Consolidated Airlines prove it. Last November, the line transported 43 live reindeer on the first leg of their journey from Nunivak Island, Alaska, to Los Angeles. Some of Santa's helpers seemed a bit startled by this new experience, but all arrived live and kicking.

This goes to prove that local carriers can transport almost anything — safely and quickly. In the words of a local carrier sales representative, "If it's transportable, we'll find a way to take it."

Foreign tourists may favor smaller U.S. communities. Backed by vigorous promotion by the Federal Government and growing prosperity abroad, foreign tourism to the U.S. could as much as quadruple in the next decade.

Smaller communities offer many unique attractions to the foreign visitor . . . local color, historical points of interest, plus generally lower prices for accommodations. Judicious planning, in conjunction with local airline service, could enable these communities to capture a big share of the foreign tourist trade.

For example, a vacation trip for the foreign visitor might include historical homes, cities, and battlefields of the Middle Atlantic states — accessible through Piedmont Airlines. For a glimpse of America at its flamboyant best, he might visit such places as Las Vegas, Reno and Palm Springs on all-jetprop Bonanza Airlines flights.

Many local service airlines already offer "package" vacation tours to points of interest in their territories.

Bootstrap operation rebuilds economy of twin Illinois cities. When civic leaders of Merion-Herrin, Illinois, launched an all-out campaign back in 1943 to attract new industry, they gave air transportation top priority. A new multi-million dollar airport made the area readily accessible via Ozark Airlines.

Since then, no less than 50 new industries have moved into the area. Nearly 5,000 new jobs have been created. Air service has made an important contribution to this spectacular growth and has more than kept pace with the area's booming economy. Every month, Ozark flies an average of 600 passengers and 25,588 pounds of cargo in and out of Merion-Herrin.

Commuter-type, no-reservation service speeds businessmen in a hurry. Fast, frequent, commuter-type flights offered by many local carriers are made-to-order for businessmen who want to get around. Because of these flights, it is now possible to visit as many as four cities — hundreds of miles apart — in a single day.

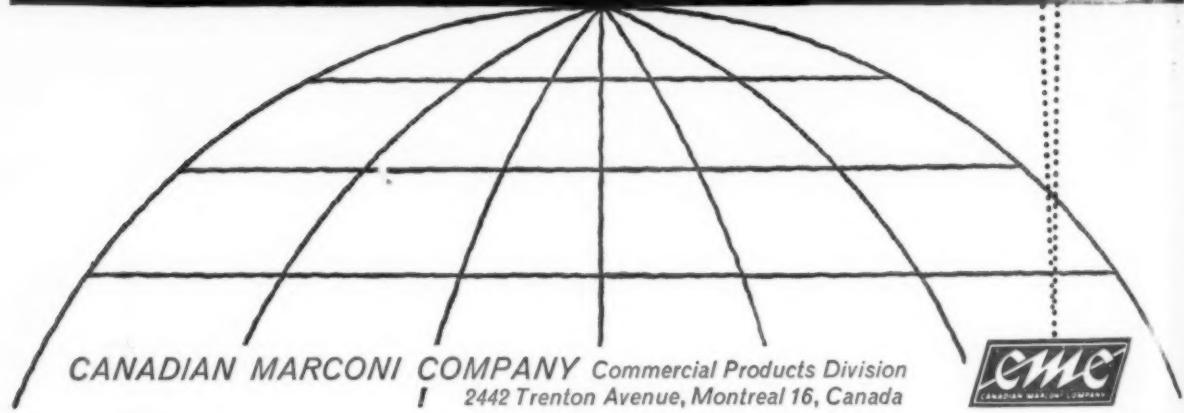
Allegheny Airlines offers an exceptionally convenient commuter service. Reservations and baggage check-ins are unnecessary between such key cities as Pittsburgh, Philadelphia, Providence and Boston. Even ticketing is done in flight. Best of all, fare discounts average 35%.

Frontier Airlines schedules twice-daily commuter-type flights to most major cities in the Denver area. And **North Central Airlines** flights connect Chicago many times daily with such cities as Milwaukee, Detroit, Duluth and Minneapolis.

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